

**UNDERGROUND INJECTION CONTROL
PERMIT APPLICATION**

**Ute Tribal # 31-07
1976' FNL & 2168' FEL
Sec. 31, T5S-R3W
Duchesne County, Utah
API # 43-013-32036**

July 2015

Prepared for:
Bruce Suchomel
Groundwater Program, Mail Code 8P-W-UIC
U.S. Environmental Protection Agency
1595 Wynkoop St
Denver, CO 80202-1129

Prepared by:
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Boise, Idaho 83707
(208) 685-7600
FAX (208) 685-7605

LIST OF ATTACHMENTS

- Attachment No. 1 Area Topography Map
- Attachment No. 2 Site Map
- Attachment No. 3 Map of the A-Marker surface
- Attachment No. 4 Cross-Sections of the injection formation
- Attachment No. 5 Water Analysis
- Attachment No. 6 Completion data for all wells in the AOR
- Attachment No. 7 CBL for the UIC well
- Attachment No. 8 Open hole log for the UIC well
- Attachment No. 9 List of owners and Affidavit Notification
- Attachment No. 10 Well bore diagrams for the UIC well
- Attachment No. 11 P&A procedure
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SUMMARY DOCUMENT
UIC WELL APPLICATION
Ute Tribal 31-07
API # 43-013-32036

The following document contains information provided in support of the application for the conversion of the Ute Tribal 31-07 well to an injection well in the Green River formation in the Antelope Creek Field in Duchesne County, Utah.

The Antelope Creek Field falls within the Uintah and Ouray Indian reservations and is within Indian Country; therefore, for facilities located on the reservation, only EPA-issued UIC permits are necessary for compliance with UIC regulations.

The EPA has issued an Area Permit #UT20736-00000 for the Underground Injection Control for the Antelope Creek Field. This area permit allows for additional producing wells to be converted to injection wells for enhanced recovery.

- (1) Petroglyph Energy, Inc. (Petroglyph) is the operator and only working interest owner of wells located in the Antelope creek Field, Duchesne County, Utah. Petroglyph's business address is provided below:

Petroglyph Energy, Inc.
960 Broadway Avenue, Suite 500
P.O. Box 70019
Boise, ID 83707

- (2) Enclosed as Attachment No. 1 is a topographic map of a portion of the Antelope Creek Field, identifying all wells located in this area. The legal location for the Ute Tribal 31-07 is 1976' FNL & 2168' FEL SW/NE Sec. 31, T5S-R3W.
- (3) Attachment No. 2 is a map of the well. This map shows a circle with a $\frac{1}{4}$ mile radius centered on the Ute Tribal 31-07 well. The $\frac{1}{4}$ mile radius encompasses the area of review, AOR, within which Petroglyph is required to investigate all wells for mechanical integrity. The $\frac{1}{4}$ mile radius also identifies mineral ownership; all lands within the AOR are leased to Petroglyph by the Ute Tribe as indicated by yellow shading. The AOR has Ute Tribal 31-06 well(s) located in its $\frac{1}{4}$ mile radius.

- (4) Petroglyph proposes to utilize the Ute Tribal 31-07 as an injection well for enhanced recovery in the Antelope Creek Field.
- (5) Injection Zone – The injection intervals are between 3982' and 5954' True Vertical Depth and located in the lower portion of the Green River Formation. The injection zone is confined within a 1972' section between the Green River "A" Lime marker bed and the top of the Basal Carbonate in the lower part of the formation. The injection zone is composed of lenticular calcareous sandstones interbedded with low permeable carbonates and calcareous shales. The lenticular sandstones vary in thickness from 1 to 30 feet.

Confining Zone – The overall confining strata above the injection zone consists of impermeable Green River calcareous shales and continuous beds of microcrystalline dolostone. The confining zone in the Ute Tribal 31-07 is 217 feet thick.

Attachment No. 3 is a structure map of the A-Marker surface.

Attachment No. 4 is a cross-section of the injection interval and confining zone.

- (6) Enclosed as Attachment No. 5 are standard analyses of produced water from three batteries that currently serve as central handling facilities for all project producing wells. The analysis of the Green River formation water from the Ute Tribal 18-08 Satellite Battery is 12805 mg/L of total dissolved solids (TDS), Ute Tribal 21-11 Satellite Battery is 15659 mg/L TDS, and Ute Tribal 34-12-D3 Satellite Battery is 14590 mg/L TDS.

Injectate in the field is a mixture of produced water and fresh make-up water. The nearest injection well is the Ute Tribal 30-15, the most recent analysis of the water being injected into the Green River formation at this location is 10160 mg/L TDS. This analysis is also included in Attachment No. 5.

- (7) A summary of completion data from the Ute Tribal 31-07 and offset wells in the AOR are included in Attachment No. 6
- (8) The cement bond log is included in Attachment No. 7.
- (9) The open hole log for the Ute Tribal 31-07 is included in Attachment No. 8.

- (10) The Antelope Creek Field is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy. At the Ute Tribal 31-07 location, all mineral owners, surface owners and operators located within the AOR ¼ mile radius have been notified of the submitted EPA application to convert to injection. Attachment No. 9 is the Affidavit of Notification to all owners.

- (11) Petroglyph requests a maximum surface injection pressure of **1802psi**. The EPA Area Permit No. UT20736-00000 uses the formula:

$$P_m = (0.88\text{psi}/\text{ft} - 0.43\text{psi}/\text{ft}(S_g)) D$$

Where:

P_m = Maximum surface injection pressure

0.88psi/ft = Fracture gradient

D = Top perforation depth

0.43psi/ft = Hydrostatic pressure/hydraulic head

S_g = Specific gravity of injection fluid

For the Ute Tribal 31-07:

$$\mathbf{1802\text{psi} = (0.88\text{psi}/\text{ft} - 0.43(1.00)) 4004\text{ft}}$$

- (12) Three wellbore diagrams for the Ute Tribal 31-07 are in Attachment No. 10. One diagram is for production, one for injection, and one for Plug & Abandonment (P&A).

- (13) The P&A procedure for this well is shown in Attachment No. 11.

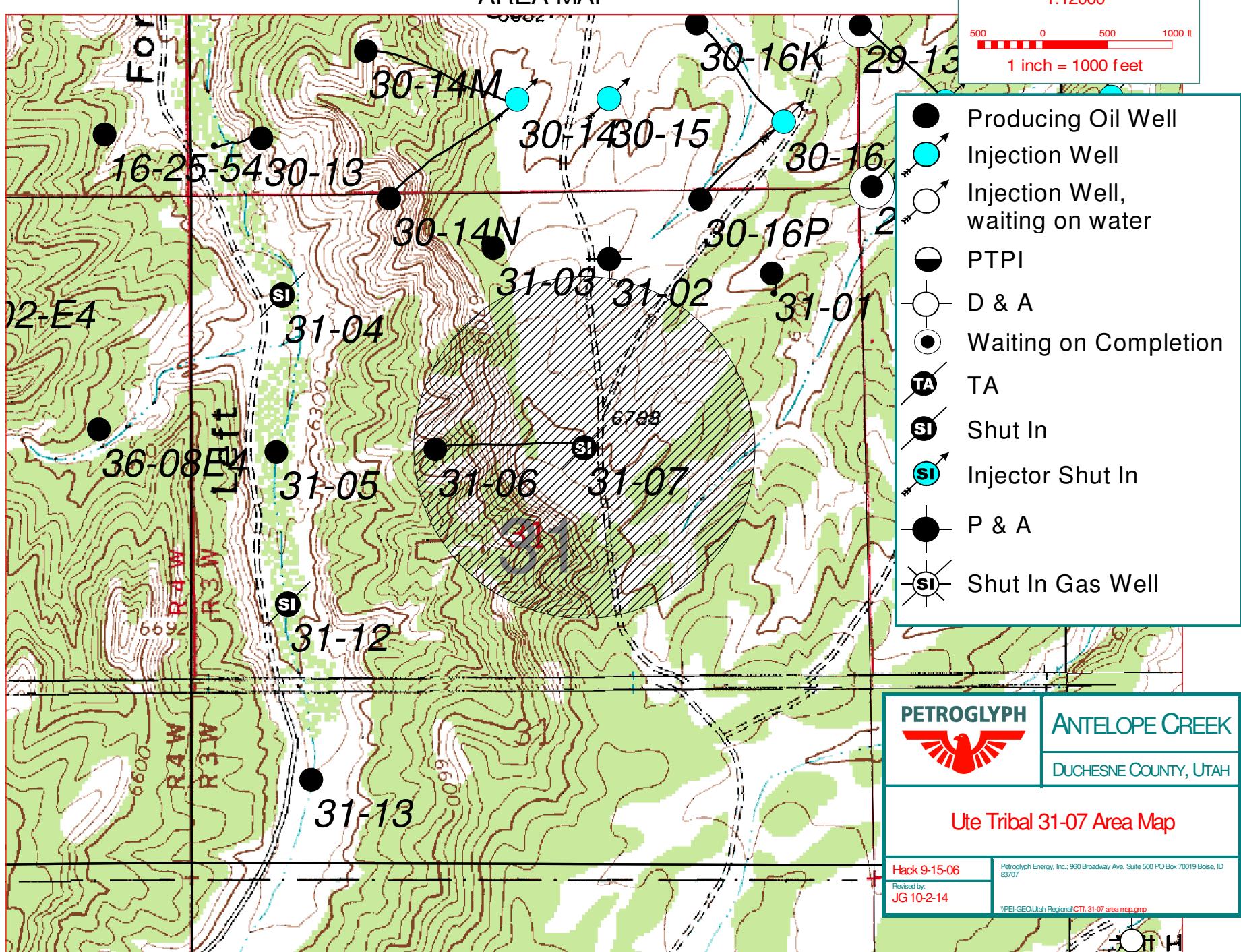
- (14) Once the draft permit is issued, Petroglyph will conduct a Mechanical Integrity Test and a static bottom-hole pressure test. The MIT procedure is contained in Attachment No. 12. The conversion work will be satisfactorily completed and submitted to the EPA on Form 7520-12. A wellbore schematic will be included with this form.

- (15) Petroglyph will give proof of financial responsibility by posting a surety bond for the UIC well prior to final permit approval. A copy of this letter is contained in Attachment No. 13.
- (16) Petroglyph will install various gauges on the well so that the injection pressure and tubing/casing annulus pressure can be monitored. The well will be equipped with a flow meter with a cumulative volume recorder.

ATTACHMENT NO. 1

AREA MAP

**ATTACHMENT NO. 1:
AREA MAP**



ATTACHMENT NO. 2

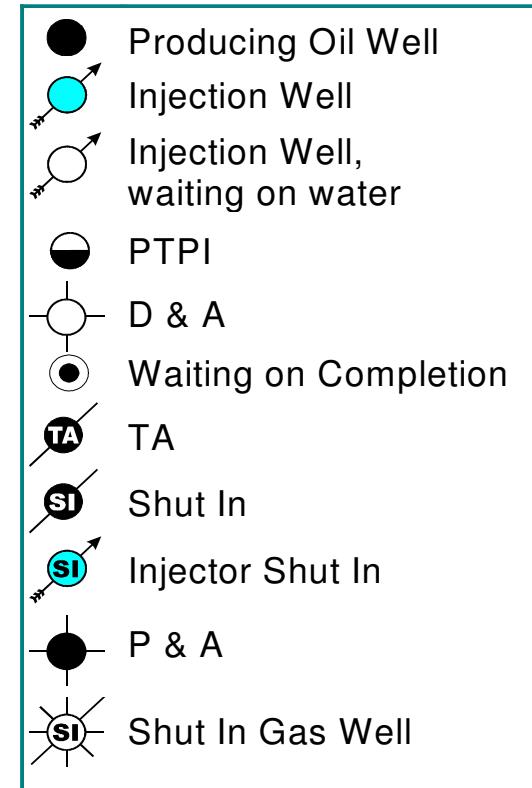
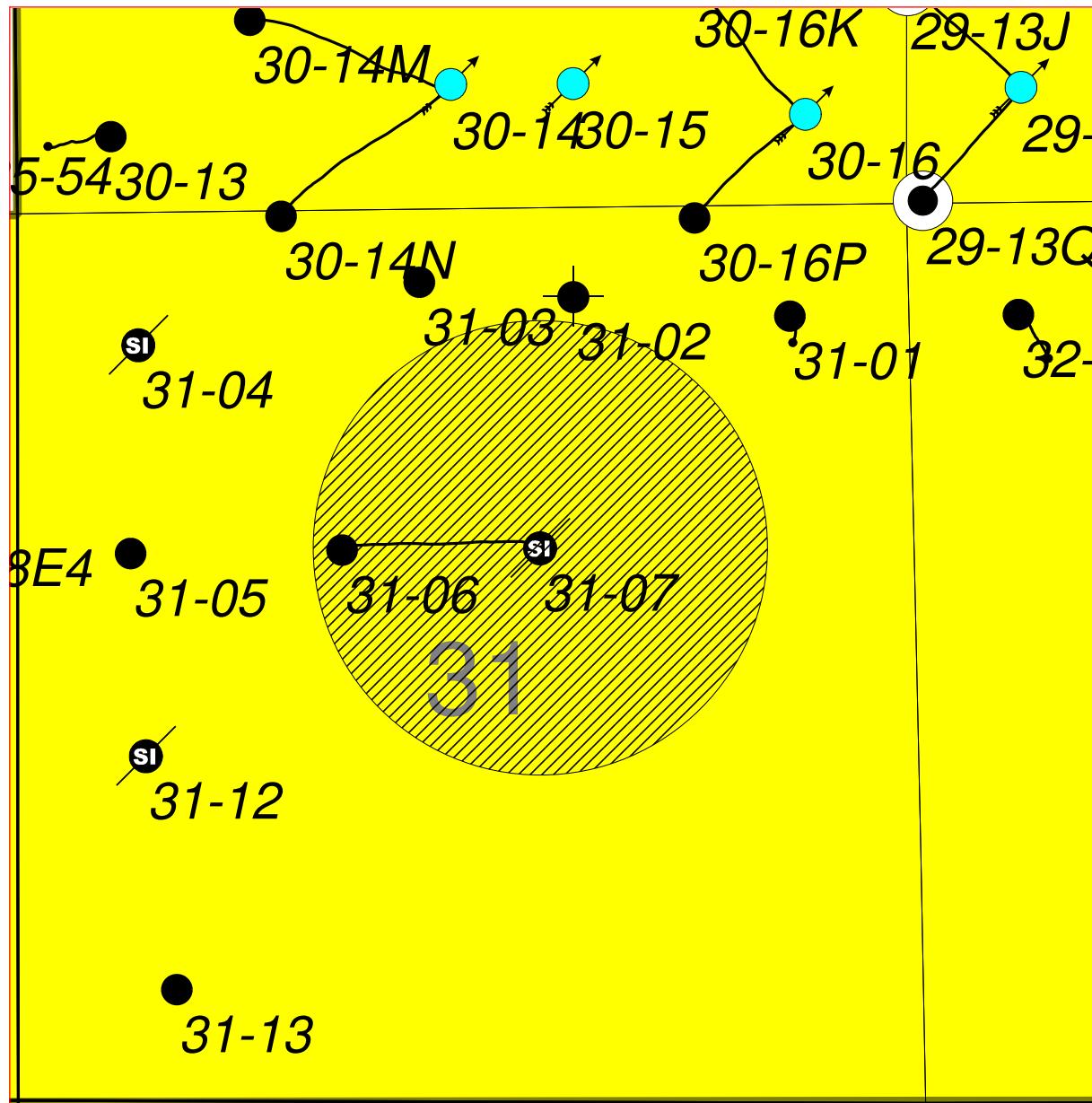
SITE MAP

RADIUS MAP OF ADJACENT WELLS

ATTACHMENT NO. 2:
SITE MAP

1:12000

500 0 500 1000 ft
1 inch = 1000 feet

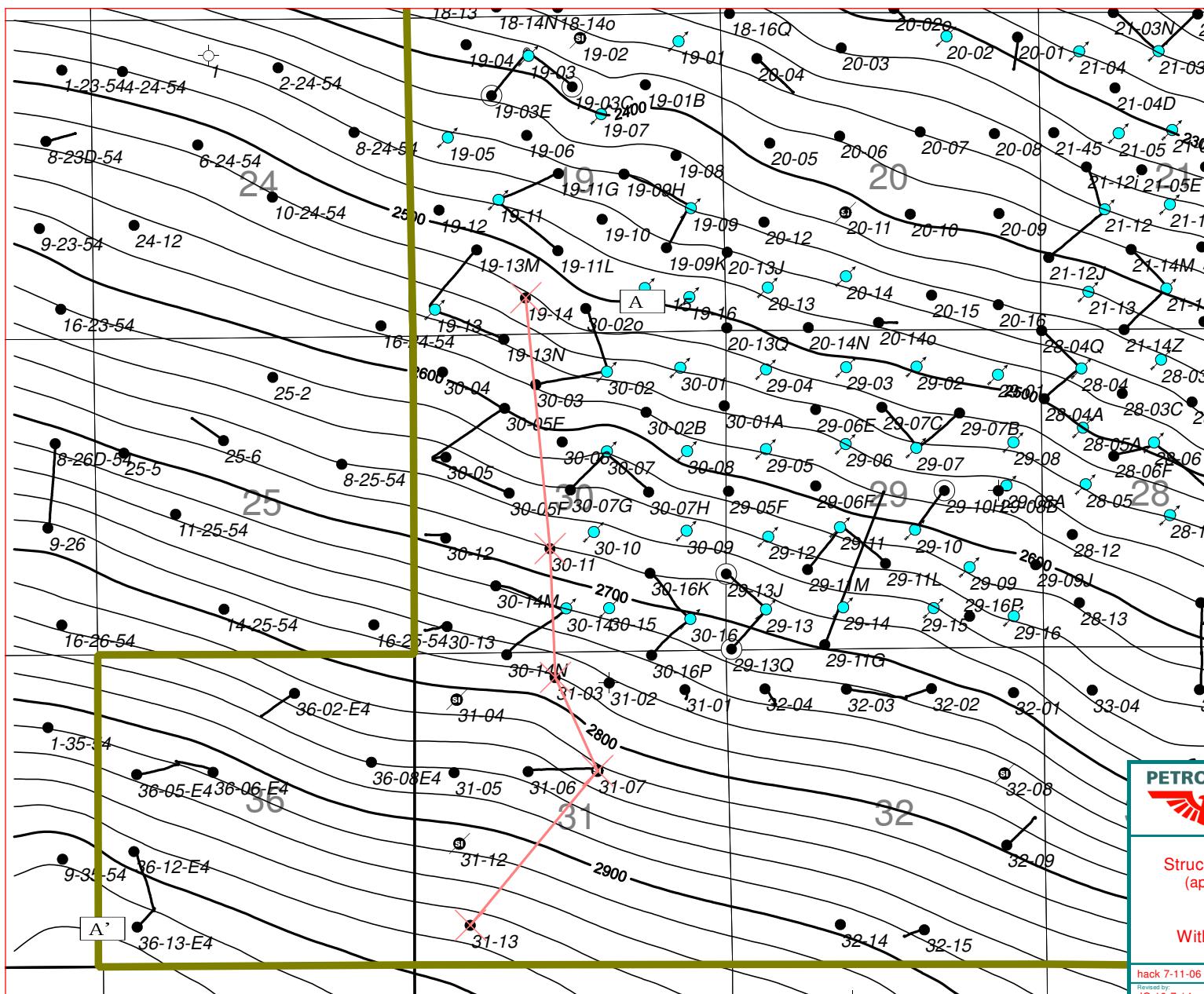


PETROGLYPH 	ANTELOPE CREEK
	DUCHESNE COUNTY, UTAH
Ute Tribal 31-07 Plat and Quarter-mile radius map. Ute Indian lands under Petroglyph lease shown in yellow	
Hack 9-15-06	Petroglyph Energy, Inc., 960 Broadway Ave. Suite 500 PO Box 70019 Boise, ID 83707
Revised by: JG 9-3-14	UPEI-GEO-Utah Regional/CTI 31-07 quarter mile map.gmp

ATTACHMENT NO. 3

MAP OF THE A-LIME MARKER SURFACE

ATTACHMENT NO. 3:
Map of the "A" Lime Marker



ANTELOPE CREEK
DUCESNE COUNTY, UTAH

Structure Map of the "A" Lime Marker
(approximate top of Injection Zone)
in the Vicinity of the
Ute Tribal 31-07
With Line of Cross Section A to A'

hack 7-11-06
Revised by:
JG 10-7-14

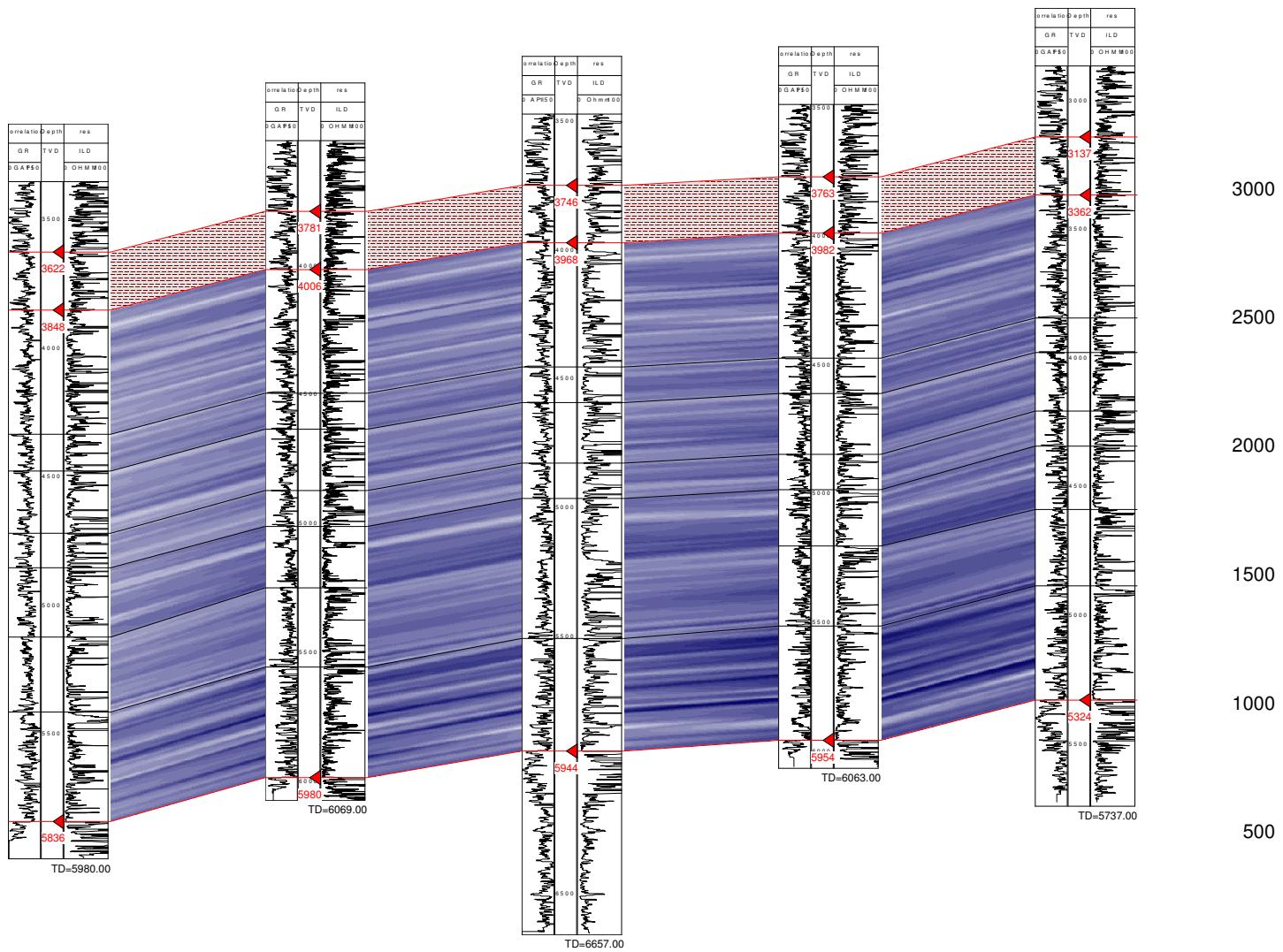
Petroglyph Energy, Inc., 555 S. Cole Rd., Boise, ID 83709
USGS/GeoUtah Regional CTI/31-07 structure map.gnp

ATTACHMENT NO. 4

CROSS SECTIONS OF THE INJECTION FORMATION

Structural Cross Section A to A' in the Vicinity of Ute Tribal 31-07

Well ID	Location	Operator	Completion Details	Geological Unit	Reservoir Thickness (ft)
43013319660000	4183 ft	PETROGLYPH OPERATING COMPANY INC	Ute Tribal 19-14 601 FSL 1922 FWL		
43013319070000	2144 ft	PETROGLYPH OPERATING COMPANY INC	Ute Tribal 30-11 1721 FSL 2274 FWL		
43013311880000	1698 ft	PETROGLYPH OPERATING COMPANY INC	Ute Tribal 31-03 422 FNL 2336 FWL		
43013320360000	3322 ft	PETROGLYPH OPERATING COMPANY INC	Ute Tribal 31-07 1976 FNL 2168 FEL		
43013320390000		PETROGLYPH OPERATING COMPANY INC	Ute Tribal 31-13 644 FSL 929 FWL		
TWP: 5 S - Range: 3 W - Sec. 19	TWP: 5 S - Range: 3 W - Sec. 30	TWP: 5 S - Range: 3 W - Sec. 31	TWP: 5 S - Range: 3 W - Sec. 31	TWP: 5 S - Range: 3 W - Sec. 31	



ATTACHMENT NO. 5

WATER ANALYSIS

Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS
 Well Name: UTE TRIBAL 18-08 SATELLITE, DUCHESN
 Sample Point: PLANT DISCHARGE COMPLETE
 Sample Date: 4/21/2015
 Sample ID: WA-307075

Sales Rep: James Patry
 Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from
 Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0061
pH:	8.50
Calculated TDS (mg/L):	12805.08
CO ₂ in Gas (%):	
Dissolved CO ₂ (mg/L):	0.00
H ₂ S in Gas (%):	
H ₂ S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	mg/L	Anions	mg/L
Sodium (Na):	4541.75	Chloride (Cl):	6000.00
Potassium (K):	41.78	Sulfate (SO ₄):	163.00
Magnesium (Mg):	28.63	Bicarbonate (HCO ₃):	1952.00
Calcium (Ca):	67.44	Carbonate (CO ₃):	
Strontium (Sr):	5.41	Acetic Acid (CH ₃ COO):	
Barium (Ba):	0.90	Propionic Acid (C ₂ H ₅ COO):	
Iron (Fe):	2.74	Butanoic Acid (C ₃ H ₇ COO):	
Zinc (Zn):	1.29	Isobutyric Acid ((CH ₃) ₂ CHCOO):	
Lead (Pb):	0.05	Fluoride (F):	
Ammonia NH ₃ :		Bromine (Br):	
Manganese (Mn):	0.09	Silica (SiO ₂):	

Notes:

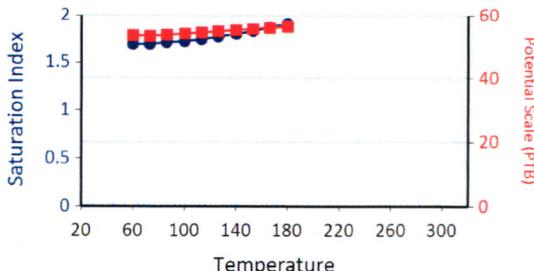
(PTB = Pounds per Thousand Barrels)

Temp (°F)	PSI	Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO ₄ ·2H ₂ O		Celestite SrSO ₄		Halite NaCl		Zinc Sulfide	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.91	56.41	0.09	0.09	0.00	0.00	2.59	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.87	56.05	0.13	0.14	0.00	0.00	2.54	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	1.83	55.66	0.19	0.19	0.00	0.00	2.49	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	1.80	55.27	0.26	0.24	0.00	0.00	2.44	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	1.77	54.86	0.33	0.29	0.00	0.00	2.38	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	1.74	54.46	0.42	0.33	0.00	0.00	2.32	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	1.72	54.08	0.52	0.38	0.00	0.00	2.26	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	1.71	53.72	0.64	0.41	0.00	0.00	2.20	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	1.69	53.39	0.77	0.45	0.00	0.00	2.14	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	1.69	53.56	0.92	0.47	0.00	0.00	2.08	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

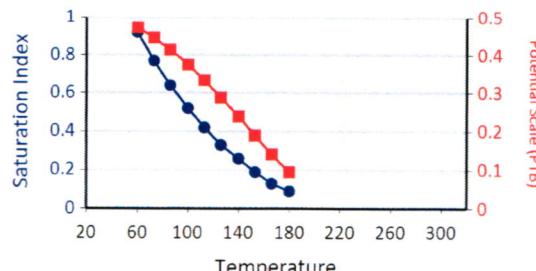
Temp (°F)	PSI	Hemihydrate CaSO ₄ ·0.5H ₂ O		Anhydrate CaSO ₄		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	1.19	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Water Analysis Report

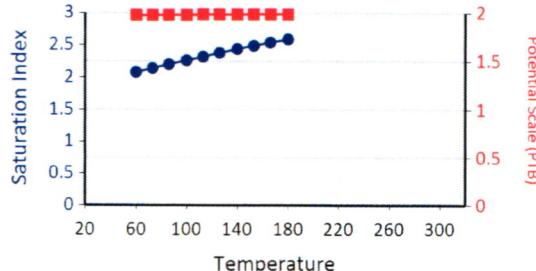
Calcium Carbonate



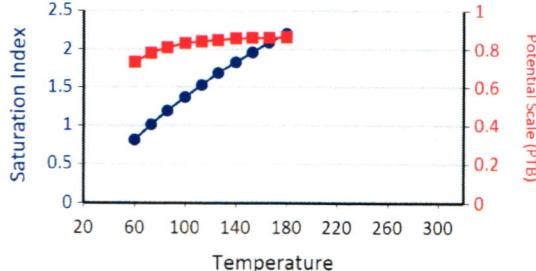
Barium Sulfate



Iron Carbonate



Zinc Carbonate



Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS
 Well Name: UTE TRIBAL 21-11 SATELLITE, DUCHESNE
 Sample Point: PLANT DISCHARGE COMPLETE
 Sample Date: 4/21/2015
 Sample ID: WA-307071

Sales Rep: James Patry
 Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from
 Brine Chemistry Consortium (Rice University)

Sample Specifics		Analysis @ Properties in Sample Specifics											
Test Date:	4/21/2015	Cations				mg/L				Anions			
System Temperature 1 (°F):	60.00	Sodium (Na):				5585.76	Chloride (Cl):						7000.00
System Pressure 1 (psig):	14.70	Potassium (K):				55.43	Sulfate (SO ₄):						277.00
System Temperature 2 (°F):	180.00	Magnesium (Mg):				10.62	Bicarbonate (HCO ₃):						2684.00
System Pressure 2 (psig):	2000.00	Calcium (Ca):				30.52	Carbonate (CO ₃):						
Calculated Density (g/ml):	1.0081	Strontium (Sr):				6.47	Acetic Acid (CH ₃ COO):						
pH:	8.70	Barium (Ba):				1.02	Propionic Acid (C ₃ H ₅ COO):						
Calculated TDS (mg/L):	15659.01	Iron (Fe):				1.09	Butanoic Acid (C ₃ H ₇ COO):						
CO ₂ in Gas (%):		Zinc (Zn):				6.88	Isobutyric Acid ((CH ₃) ₂ CHCOO):						
Dissolved CO ₂ (mg/L):	0.00	Lead (Pb):				0.08	Fluoride (F):						
H ₂ S in Gas (%):		Ammonia NH ₃ :					Bromine (Br):						
H ₂ S in Water (mg/L):	35.00	Manganese (Mn):				0.14	Silica (SiO ₂):						

Notes:

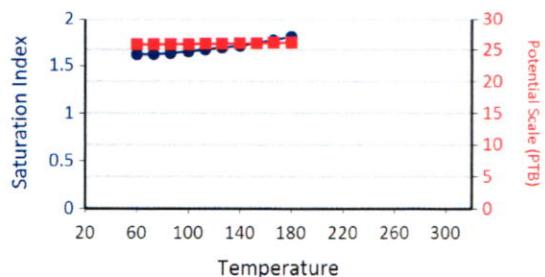
(PTB = Pounds per Thousand Barrels)

Calcium Carbonate				Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO ₄ -2H ₂ O		Celestite SrSO ₄		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.81	26.18	0.28	0.29	3.60	0.60	2.44	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.37	3.59
166	1779	1.77	26.13	0.33	0.32	3.61	0.60	2.40	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.52	3.59
153	1558	1.74	26.09	0.39	0.36	3.63	0.60	2.35	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.68	3.59
140	1338	1.71	26.05	0.45	0.39	3.67	0.60	2.30	0.79	0.00	0.00	0.00	0.00	0.00	0.00	11.86	3.59
126	1117	1.69	26.00	0.53	0.43	3.72	0.60	2.25	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.05	3.59
113	897	1.67	25.97	0.62	0.46	3.79	0.60	2.20	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.27	3.59
100	676	1.65	25.93	0.72	0.49	3.87	0.60	2.14	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.50	3.59
86	455	1.63	25.91	0.84	0.52	3.97	0.60	2.08	0.79	0.00	0.00	0.00	0.00	0.00	0.00	12.76	3.59
73	235	1.62	25.88	0.97	0.54	4.09	0.60	2.02	0.79	0.00	0.00	0.00	0.00	0.00	0.00	13.04	3.59
60	14	1.62	25.87	1.12	0.56	4.23	0.60	1.96	0.79	0.00	0.00	0.00	0.00	0.00	0.00	13.34	3.59

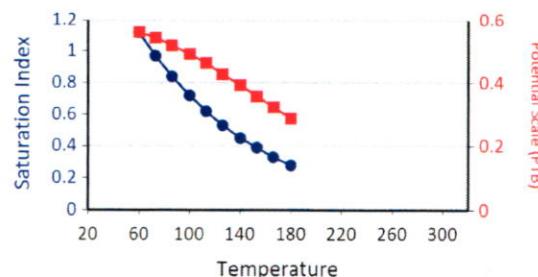
Hemihydrate CaSO ₄ ·0.5H ₂ O				Anhydrate CaSO ₄		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	3.15	4.62	10.72	0.03	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	3.04	4.62	10.97	0.03	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	2.92	4.62	11.24	0.03	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	2.79	4.62	11.54	0.03	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	2.65	4.62	11.86	0.03	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	2.50	4.61	12.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	2.34	4.61	12.60	0.03	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	2.17	4.60	13.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	1.99	4.58	13.46	0.03	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.00	1.79	4.55	13.95	0.03	0.00	0.00	0.00	0.00	0.00	0.00

Water Analysis Report

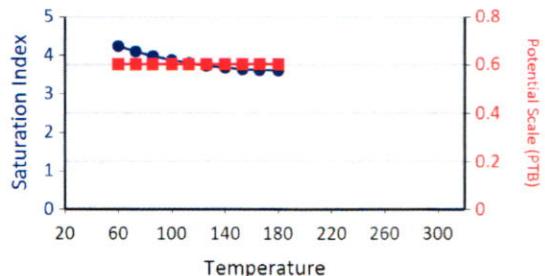
Calcium Carbonate



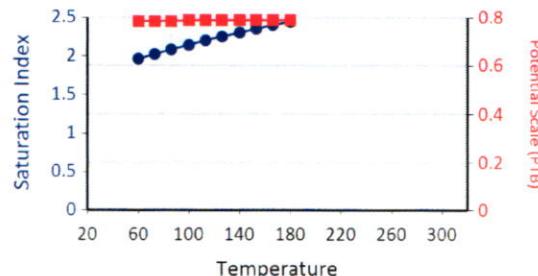
Barium Sulfate



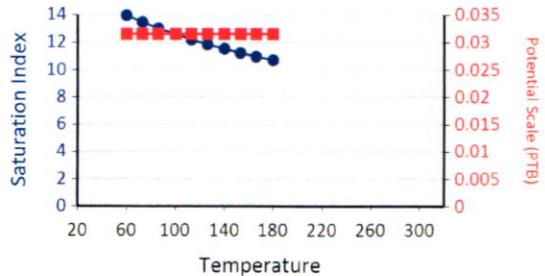
Iron Sulfide



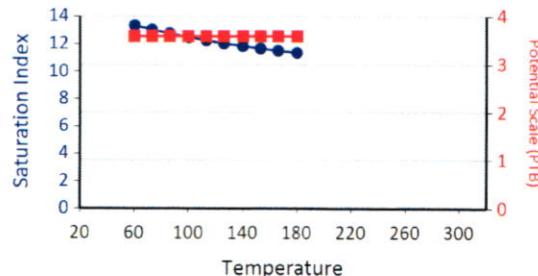
Iron Carbonate



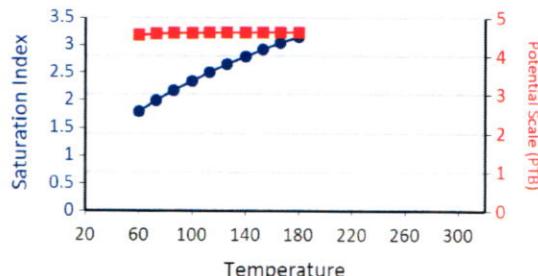
Lead Sulfide



Zinc Sulfide



Zinc Carbonate



Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS
 Well Name: UTE TRIBAL 34-12D3 SATELLITE, DUCHE
 Sample Point: PLANT DISCHARGE
 Sample Date: 4/21/2015
 Sample ID: WA-307067

Sales Rep: James Patry
 Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from
 Brine Chemistry Consortium (Rice University)

Sample Specifics	
Test Date:	4/21/2015
System Temperature 1 (°F):	60.00
System Pressure 1 (psig):	14.70
System Temperature 2 (°F):	180.00
System Pressure 2 (psig):	2000.00
Calculated Density (g/ml):	1.0073
pH:	8.50
Calculated TDS (mg/L):	14589.98
CO2 in Gas (%):	
Dissolved CO2 (mg/L):	0.00
H2S in Gas (%):	
H2S in Water (mg/L):	0.00

Analysis @ Properties in Sample Specifics			
Cations	mg/L	Anions	mg/L
Sodium (Na):	5277.36	Chloride (Cl):	7000.00
Potassium (K):	65.03	Sulfate (SO4):	0.00
Magnesium (Mg):	7.80	Bicarbonate (HCO3):	2196.00
Calcium (Ca):	24.60	Carbonate (CO3):	
Strontium (Sr):	5.20	Acetic Acid (CH3COO):	
Barium (Ba):	12.37	Propionic Acid (C2H5COO):	
Iron (Fe):	0.34	Butanoic Acid (C3H7COO):	
Zinc (Zn):	1.16	Isobutyric Acid ((CH3)2CHCOO):	
Lead (Pb):	0.04	Fluoride (F):	
Ammonia NH3:		Bromine (Br):	
Manganese (Mn):	0.08	Silica (SiO2):	

Notes:

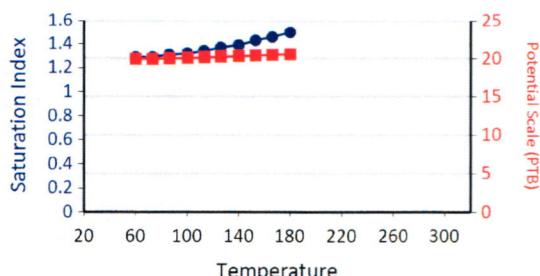
(PTB = Pounds per Thousand Barrels)

Temp (°F)	PSI	Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	1.50	20.58	0.00	0.00	0.00	0.00	1.72	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	1.46	20.48	0.00	0.00	0.00	0.00	1.67	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	1.43	20.39	0.00	0.00	0.00	0.00	1.63	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	1.39	20.30	0.00	0.00	0.00	0.00	1.57	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	1.37	20.21	0.00	0.00	0.00	0.00	1.52	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	1.34	20.13	0.00	0.00	0.00	0.00	1.46	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	1.32	20.05	0.00	0.00	0.00	0.00	1.40	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	1.31	19.99	0.00	0.00	0.00	0.00	1.34	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	1.29	19.93	0.00	0.00	0.00	0.00	1.28	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	1.29	19.93	0.00	0.00	0.00	0.00	1.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

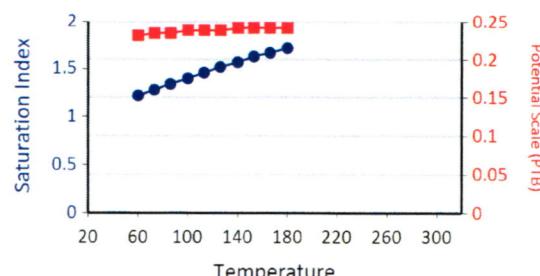
Temp (°F)	PSI	Hemihydrate CaSO4·0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
		SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
180	2000	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
166	1779	0.00	0.00	0.00	0.00	0.00	0.00	2.05	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
153	1558	0.00	0.00	0.00	0.00	0.00	0.00	1.93	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140	1338	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
126	1117	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
113	897	0.00	0.00	0.00	0.00	0.00	0.00	1.50	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	676	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	455	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
73	235	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	14	0.00	0.00	0.00	0.00	0.00	0.79	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Water Analysis Report

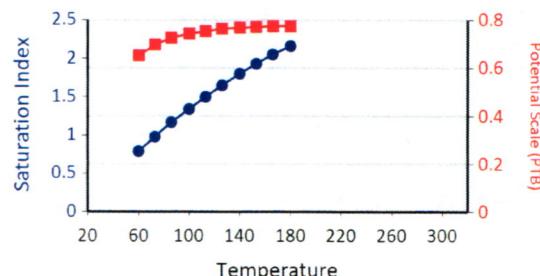
Calcium Carbonate



Iron Carbonate



Zinc Carbonate



Water Analysis Report

Production Company: PETROGLYPH OPERATING CO INC - EBUS

Well Name: PETROGLYPH U.T. 30-15, DUCHESNE

Sample Point: WELLHEAD

Sample Date: 1/7/2015

Sample ID: WA-298186

Sales Rep: James Patry

Lab Tech: Gary Winegar

Scaling potential predicted using ScaleSoftPitzer from
Brine Chemistry Consortium (Rice University)**Sample Specifics**

Test Date:	1/21/2015
System Temperature 1 (°F):	160
System Pressure 1 (psig):	1300
System Temperature 2 (°F):	80
System Pressure 2 (psig):	15
Calculated Density (g/ml):	1.0037
pH:	8.50
Calculated TDS (mg/L):	10160.63
CO2 in Gas (%):	
Dissolved CO2 (mg/L):	0.00
H2S in Gas (%):	
H2S in Water (mg/L):	35.00

Analysis @ Properties in Sample Specifics

Cations	mg/L	Anions	mg/L
Sodium (Na):	2313.15	Chloride (Cl):	5000.00
Potassium (K):	35.31	Sulfate (SO4):	229.00
Magnesium (Mg):	37.30	Bicarbonate (HCO3):	2440.00
Calcium (Ca):	60.65	Carbonate (CO3):	
Strontium (Sr):	4.95	Acetic Acid (CH3COO):	
Barium (Ba):	7.32	Propionic Acid (C2H5COO):	
Iron (Fe):	3.27	Butanoic Acid (C3H7COO):	
Zinc (Zn):	3.04	Isobutyric Acid ((CH3)2CHCOO):	
Lead (Pb):	0.21	Fluoride (F):	
Ammonia NH3:		Bromine (Br):	
Manganese (Mn):	0.11	Silica (SiO2):	26.32

Notes:

B=5.14 Al=0 Li=1.24

(PTB = Pounds per Thousand Barrels)

		Calcium Carbonate		Barium Sulfate		Iron Sulfide		Iron Carbonate		Gypsum CaSO4·2H2O		Celestite SrSO4		Halite NaCl		Zinc Sulfide	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	1.87	51.16	1.90	4.30	4.46	1.81	2.51	2.37	0.00	0.00	0.00	0.00	0.00	0.00	12.48	1.59
88.00	157.00	1.88	51.07	1.82	4.29	4.38	1.81	2.55	2.37	0.00	0.00	0.00	0.00	0.00	0.00	12.30	1.59
97.00	300.00	1.89	51.16	1.74	4.28	4.31	1.81	2.59	2.37	0.00	0.00	0.00	0.00	0.00	0.00	12.13	1.59
106.00	443.00	1.90	51.25	1.67	4.27	4.26	1.81	2.63	2.37	0.00	0.00	0.00	0.00	0.00	0.00	11.97	1.59
115.00	585.00	1.92	51.34	1.60	4.25	4.21	1.81	2.67	2.37	0.00	0.00	0.00	0.00	0.00	0.00	11.83	1.59
124.00	728.00	1.94	51.44	1.54	4.23	4.17	1.81	2.72	2.37	0.00	0.00	0.00	0.00	0.00	0.00	11.69	1.59
133.00	871.00	1.96	51.54	1.49	4.22	4.14	1.81	2.76	2.37	0.00	0.00	0.00	0.00	0.00	0.00	11.56	1.59
142.00	1014.00	1.98	51.65	1.44	4.20	4.12	1.81	2.80	2.37	0.00	0.00	0.00	0.00	0.00	0.00	11.44	1.59
151.00	1157.00	2.01	51.75	1.40	4.19	4.10	1.81	2.84	2.37	0.00	0.00	0.00	0.00	0.00	0.00	11.33	1.59
160.00	1300.00	2.04	51.85	1.36	4.17	4.09	1.81	2.87	2.38	0.00	0.00	0.00	0.00	0.00	0.00	11.22	1.59

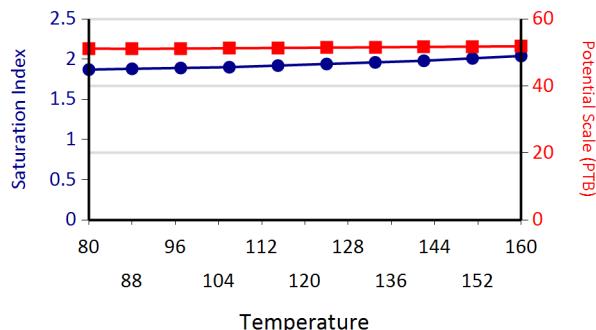
		Hemihydrate CaSO4·0.5H2O		Anhydrate CaSO4		Calcium Fluoride		Zinc Carbonate		Lead Sulfide		Mg Silicate		Ca Mg Silicate		Fe Silicate	
Temp (°F)	PSI	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB	SI	PTB
80.00	14.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	2.00	13.59	0.08	2.89	22.53	1.43	10.61	8.58	2.54
88.00	157.00	0.00	0.00	0.00	0.00	0.00	0.00	1.81	2.01	13.30	0.08	3.18	23.70	1.57	11.20	8.70	2.54
97.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	1.92	2.02	13.02	0.08	3.54	25.43	1.76	12.03	8.90	2.54
106.00	443.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	2.03	12.77	0.08	3.91	26.97	1.95	12.79	9.11	2.54
115.00	585.00	0.00	0.00	0.00	0.00	0.00	0.00	2.15	2.03	12.53	0.08	4.28	28.29	2.15	13.47	9.32	2.54
124.00	728.00	0.00	0.00	0.00	0.00	0.00	0.00	2.25	2.03	12.30	0.08	4.65	29.36	2.35	14.07	9.55	2.54
133.00	871.00	0.00	0.00	0.00	0.00	0.00	0.00	2.35	2.04	12.08	0.08	5.03	30.18	2.55	14.58	9.78	2.54
142.00	1014.00	0.00	0.00	0.00	0.00	0.00	0.00	2.45	2.04	11.88	0.08	5.41	30.78	2.76	15.00	10.02	2.54
151.00	1157.00	0.00	0.00	0.00	0.00	0.00	0.00	2.54	2.04	11.68	0.08	5.79	31.19	2.97	15.36	10.26	2.54
160.00	1300.00	0.00	0.00	0.00	0.00	0.00	0.00	2.63	2.04	11.50	0.08	6.17	31.46	3.18	15.64	10.51	2.54

Water Analysis Report

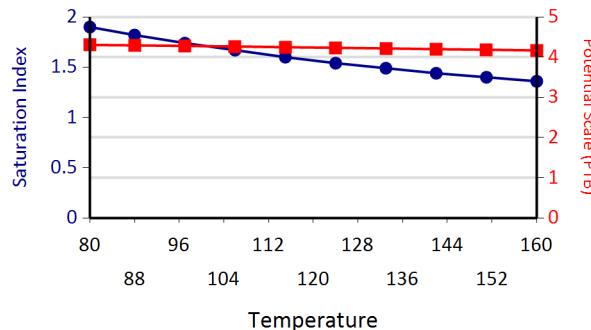
These scales have positive scaling potential under initial temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

These scales have positive scaling potential under final temperature and pressure: Calcium Carbonate Barium Sulfate Iron Sulfide Iron Carbonate Zinc Sulfide Zinc Carbonate Lead Sulfide Mg Silicate Ca Mg Silicate Fe Silicate

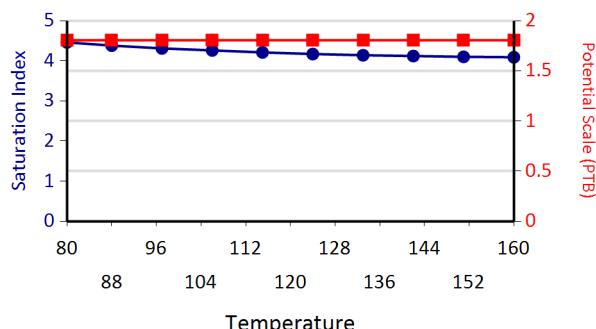
Calcium Carbonate



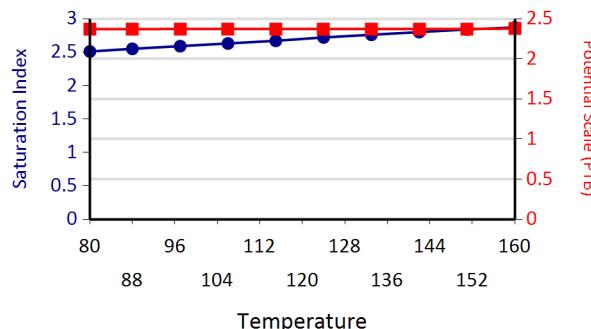
Barium Sulfate



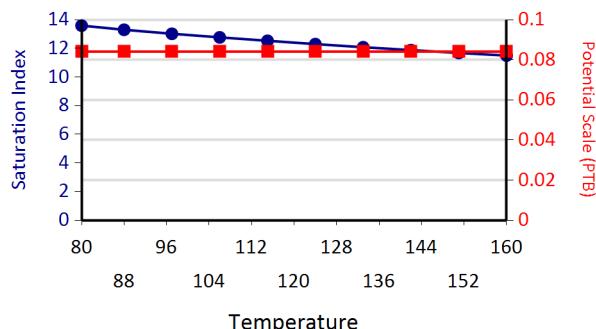
Iron Sulfide



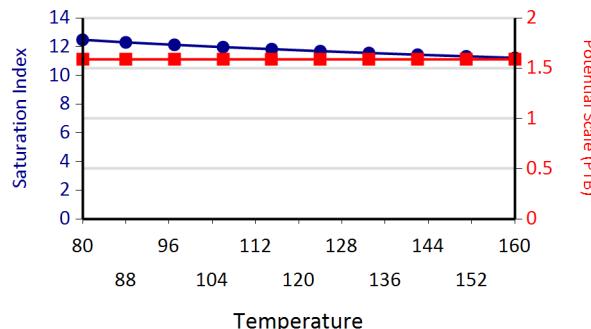
Iron Carbonate



Lead Sulfide

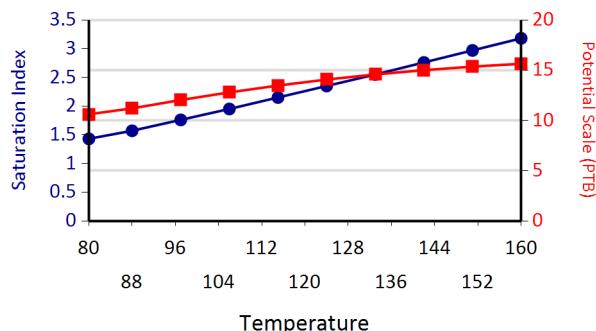


Zinc Sulfide

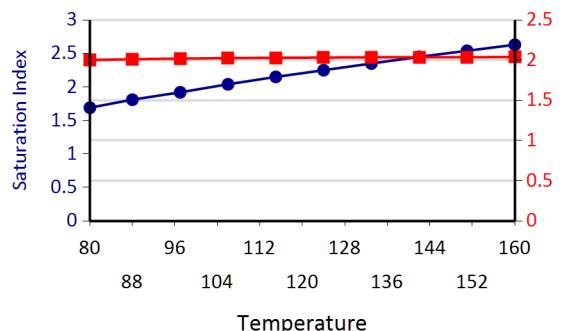


Water Analysis Report

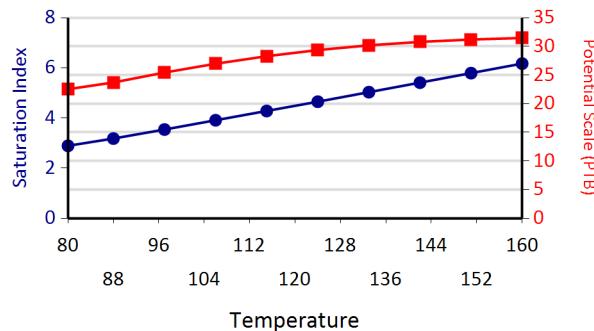
Ca Mg Silicate



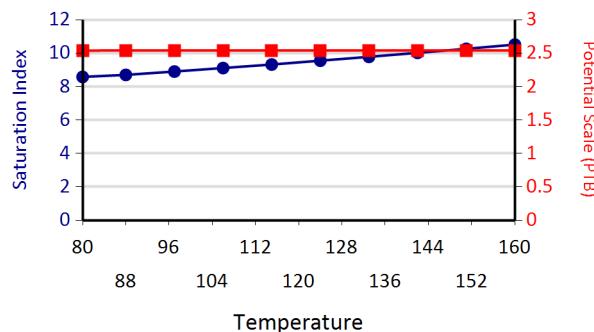
Zinc Carbonate



Mg Silicate



Fe Silicate



ATTACHMENT NO. 6

COMPLETION DATA FOR ALL WELLS IN THE AOR

Well Completion Data

Ute Tribal 31-07

Well	Surface Casing				Production Casing			
	Size (inches)	Depth (ft KB)	Cement Amount (sx)	Cement Top	Size (inches)	Depth (ft KB)	Cement Amount (sx)	Estimated Cement Top
Ute Tribal 31-07	8-5/8	276	165	surface	5-1/2	5998	590	850
Ute Tribal 31-06	8-5/8	538	360	surface	5-1/2	6377	840	surface

ATTACHMENT NO. 7

CBL FOR THE UIC WELL

COMPANY: PETROGLYPH OPERATING COMPANY

Extra

WELL: UTE TRIBAL 31-07

FIELD: ANTELOPE CREEK

COUNTY: DUCHESNE STATE: UTAH

ANTELOPE CREEK	
Field	1976 FNL & 2168 FEL
Location	UTE TRIBAL 31-07
Company	PETROGLYPH OPERATING CO.
Schlumberger	
CEMENT BOND LOG	
GAMMA RAY	
CCL	

1975-07-31 & 2168-07-

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SAFETY IS THE PRIMARY CONCERN OF THE CONTRACTOR. THE CONTRACTOR WILL
 MAKE DUE CARE AND ATTENTION AND DO NOT GUARANTEE THE WORK. SAFETY CHECKING AND ISSUING OF
 APPROVALS ARE THE CONTRACTOR'S RESPONSIBILITY. AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL
 NEGLIGENCE, CHARGE THE PARTIES OR RESPONSIBLE FOR ANY LOSS COSTS, DAMAGES OR
 EXPENSES WHICH DIRECTLY OR INDIRECTLY DERIVED ANYONE RESULTING FROM AN APPROVAL OR REJECTION MADE BY
 ANY CONTRACTOR'S PERSONNEL AND/OR CONSULTANT. THESE INTERPRETATIONS ARE ALSO SUBJECT TO
 CLAUSES 10.10 AND 10.11 OF THE GENERAL CONDITIONS. AND SET OUT IN THE EQUIPMENT SPECIFICATION.

EQUIPMENT LIST

DRILLING

CRANE

CORE

CRM

CPT

DEMAJET, DRILLING METER

DRILLING MUD PUMP, COOLER, FILTER, PUMPS, ETC.

DRILLING RIGS, TOWER

DRILLING SPARE PARTS

DRILLING SPARES

DRILLING SPARES, DRILLING METER

DRILLING SPARES

DRILLING SPARES, DRILLING METER

DRILLING SPARES

DRILLING SPARES, DRILLING METER

DRILLING SPARES, DRILLING METER, DRILLING METER

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DRILLING SPARES, DRILLING METER

DRILLING SPARES

DRILLING SPARES, DRILLING METER

DRILLING SPARES, DRILLING METER, DRILLING METER

DRILLING SPARES,
DRILLING METER

COMMON EQUIPMENT

EQUIPMENT DESCRIPTION

RUN 1
SUBSEA EQUIPMENT

RUN 2

CCU, A)

CCU, B)

26.1

SCH, A)

SCH, B)

SCH, C)

21.9

CHE, 100°C

9.4

SCH, D)

SCH, E)

SCH, F)

18.4

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

CH₃COCH₂CH₂CH₂CH₂CH₂CH₂CH₂CH₃

MAXIM. MIN. (M) = 100% (A = 100%)
MIN. MAX. (M) = 100% (A = M = 100% IN 100%)
A = 100% (A = 100%)



Output DLIS Files

DEFAULT SLT.J 007 FN:6 FIELD 13-Mar-1998 12:11 5925.5 FT 600.2 FT

OP System Version: 8C0-609 MCM

SLT.J 8C0-609
CCI AJ API.W 9702

SGT.G 8C0-609

PIP SUMMARY

F Casing Collars

Casing Collar Locator (CCL)
-19 (-) 1

MAIN PASS

Transit Time 2 (TT2)
270 (US) 170

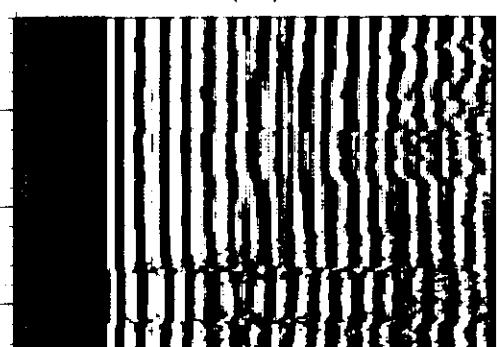
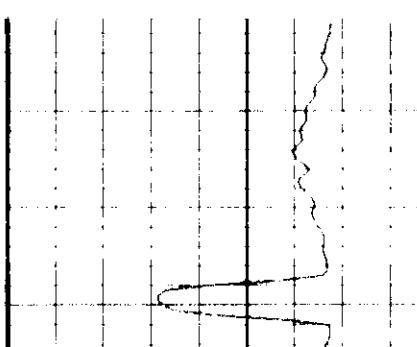
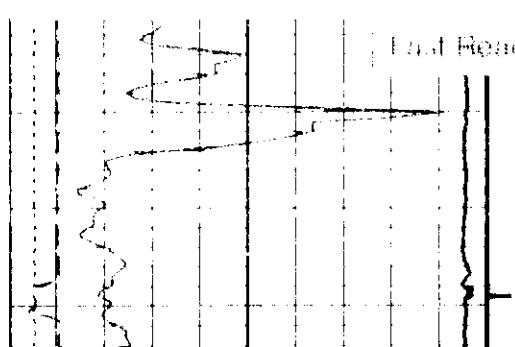
Tension (TENS)
9 (LBF) 4000

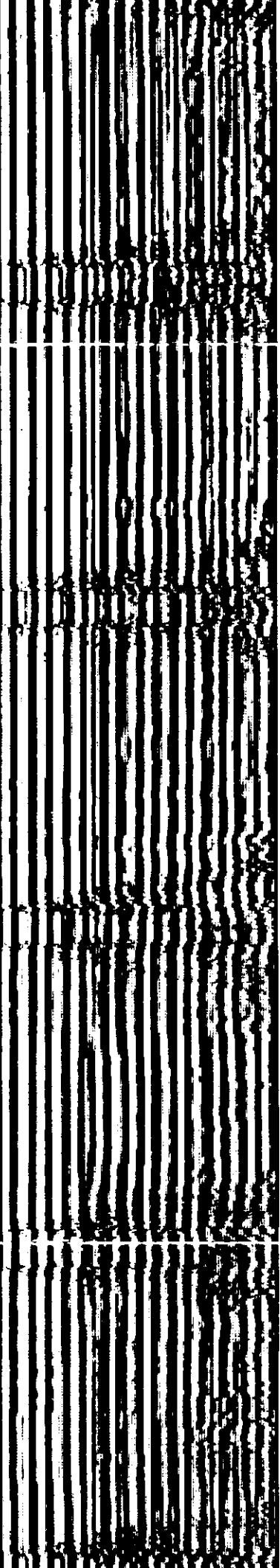
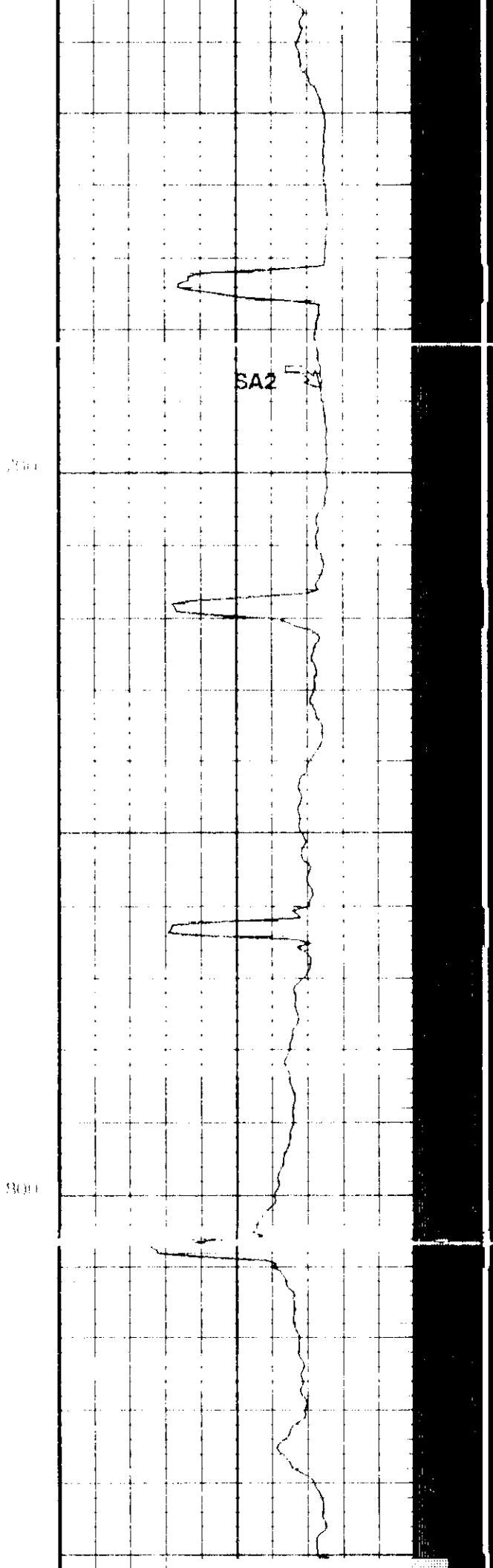
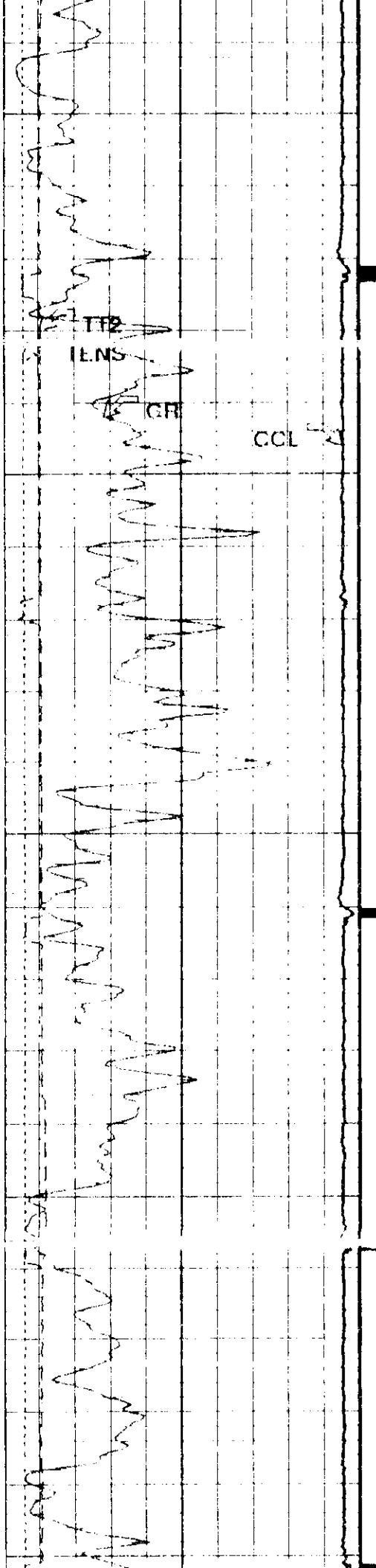
CBL Amplitude (SA2)
0 (MV) 100

Gamma Ray (GR)
0 (GAPI) 200

CBL Amplitude (SA2)
0 (MV) 20

Min Amplitude Max
200 VDL Variable Density (VDL)
(US) 1200





PST. 10M OF CEMENT

10.00

11.00

12.00

13.00

14.00

15.00

16.00

17.00

18.00

19.00

20.00

21.00

22.00

23.00

24.00

25.00

26.00

27.00

28.00

29.00

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90.00

91.00

92.00

93.00

94.00

95.00

96.00

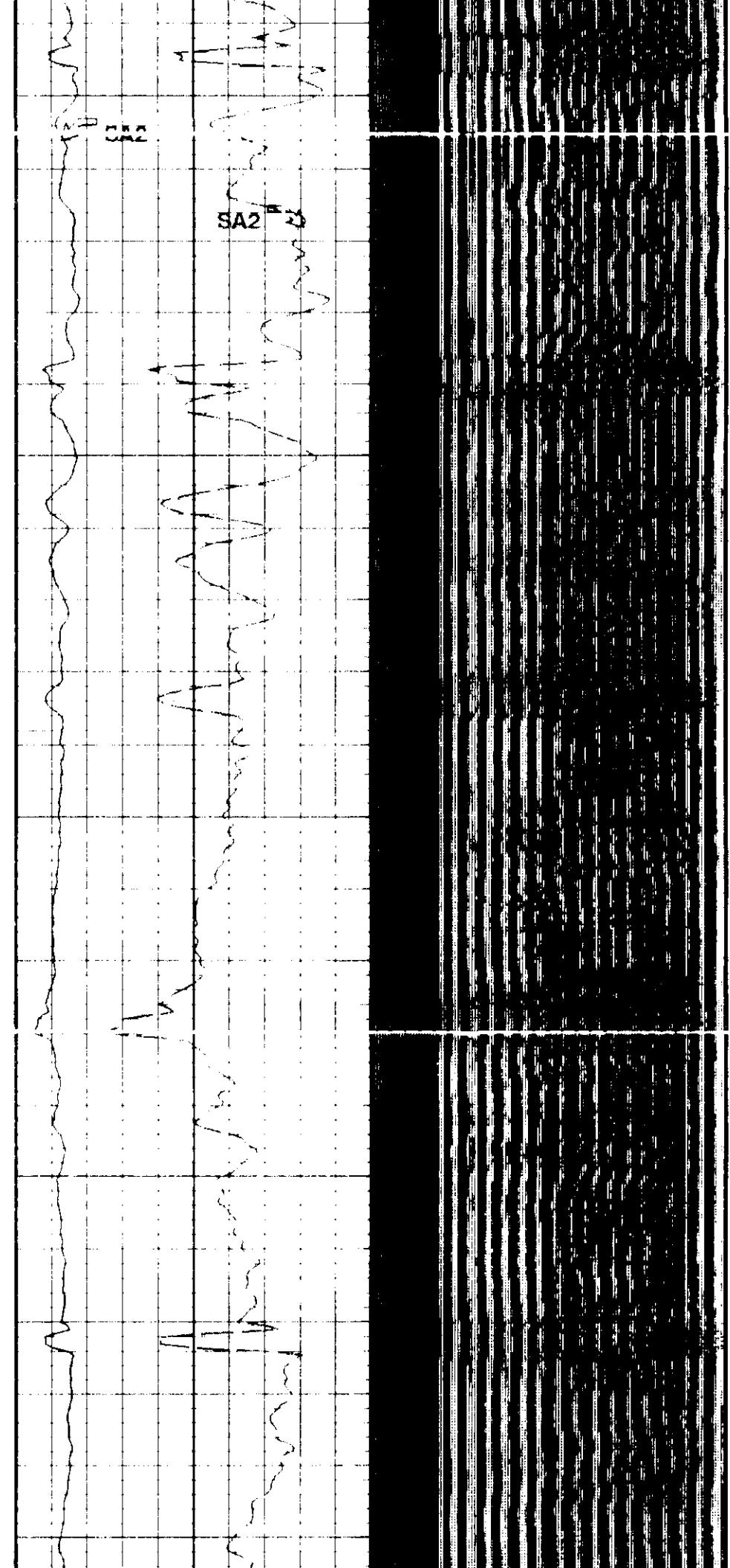
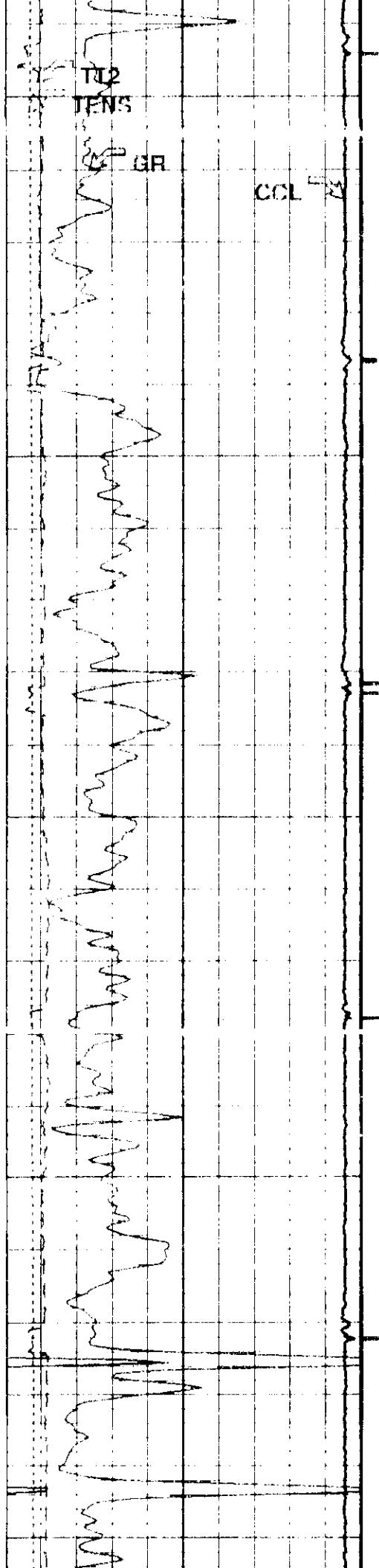
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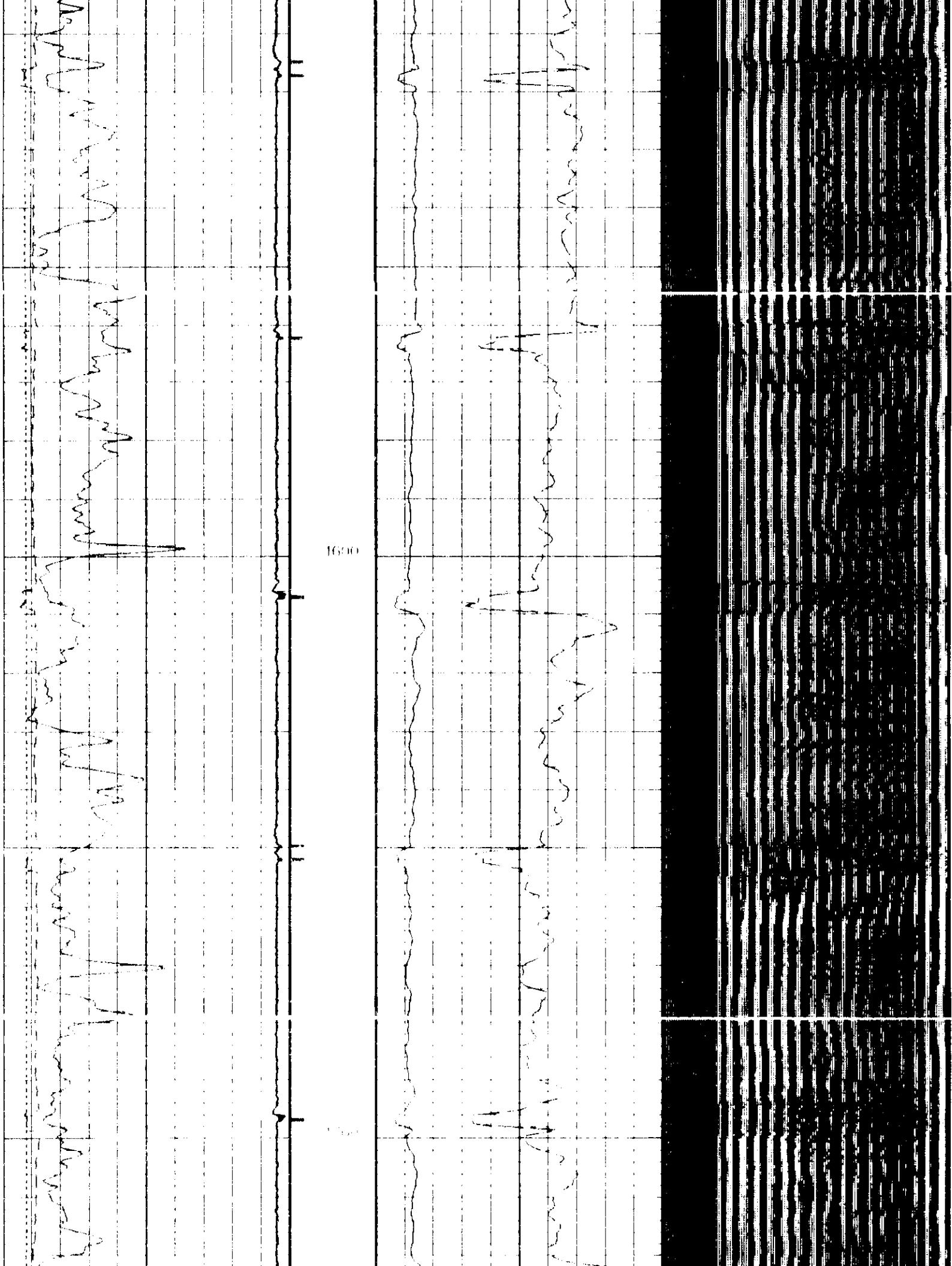
98.00

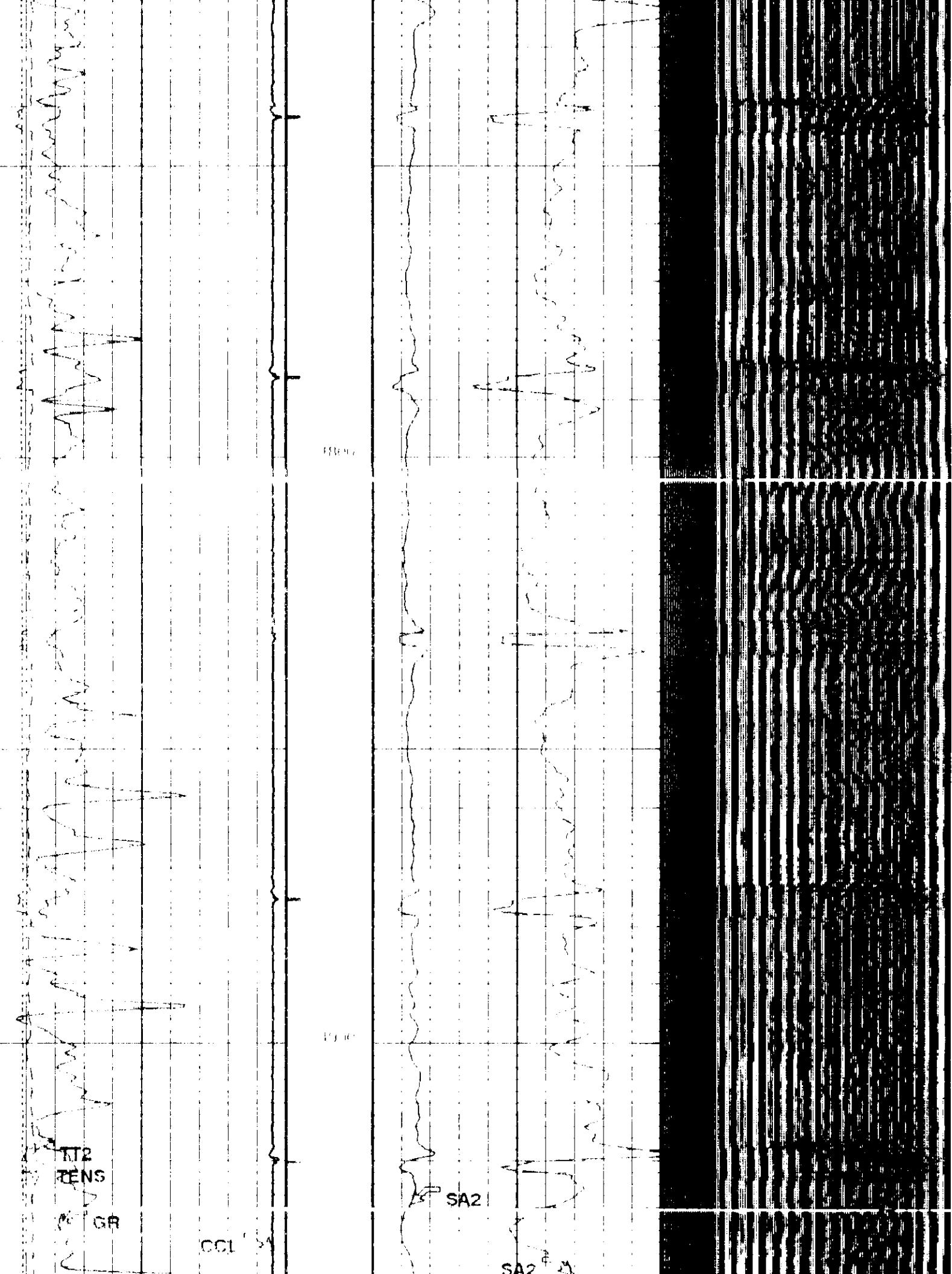
99.00

100.00

Wetland Management Plan
for the Lower Columbia River
and Willapa Bay Watersheds







1960-07-10 10:00 AM - 10:15 AM

1960-07-10 10:15 AM - 10:30 AM

1960-07-10 10:30 AM - 10:45 AM

1960-07-10 10:45 AM - 11:00 AM

1960-07-10 11:00 AM - 11:15 AM

1960-07-10 11:15 AM - 11:30 AM

1960-07-10 11:30 AM - 11:45 AM

1960-07-10 11:45 AM - 12:00 PM

1960-07-10 12:00 PM - 12:15 PM

1960-07-10 12:15 PM - 12:30 PM

1960-07-10 12:30 PM - 12:45 PM

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1960-07-10 1:15 PM - 1:30 PM

1960-07-10 1:30 PM - 1:45 PM

1960-07-10 1:45 PM - 2:00 PM

1960-07-10 2:00 PM - 2:15 PM

1960-07-10 2:15 PM - 2:30 PM

1960-07-10 2:30 PM - 2:45 PM

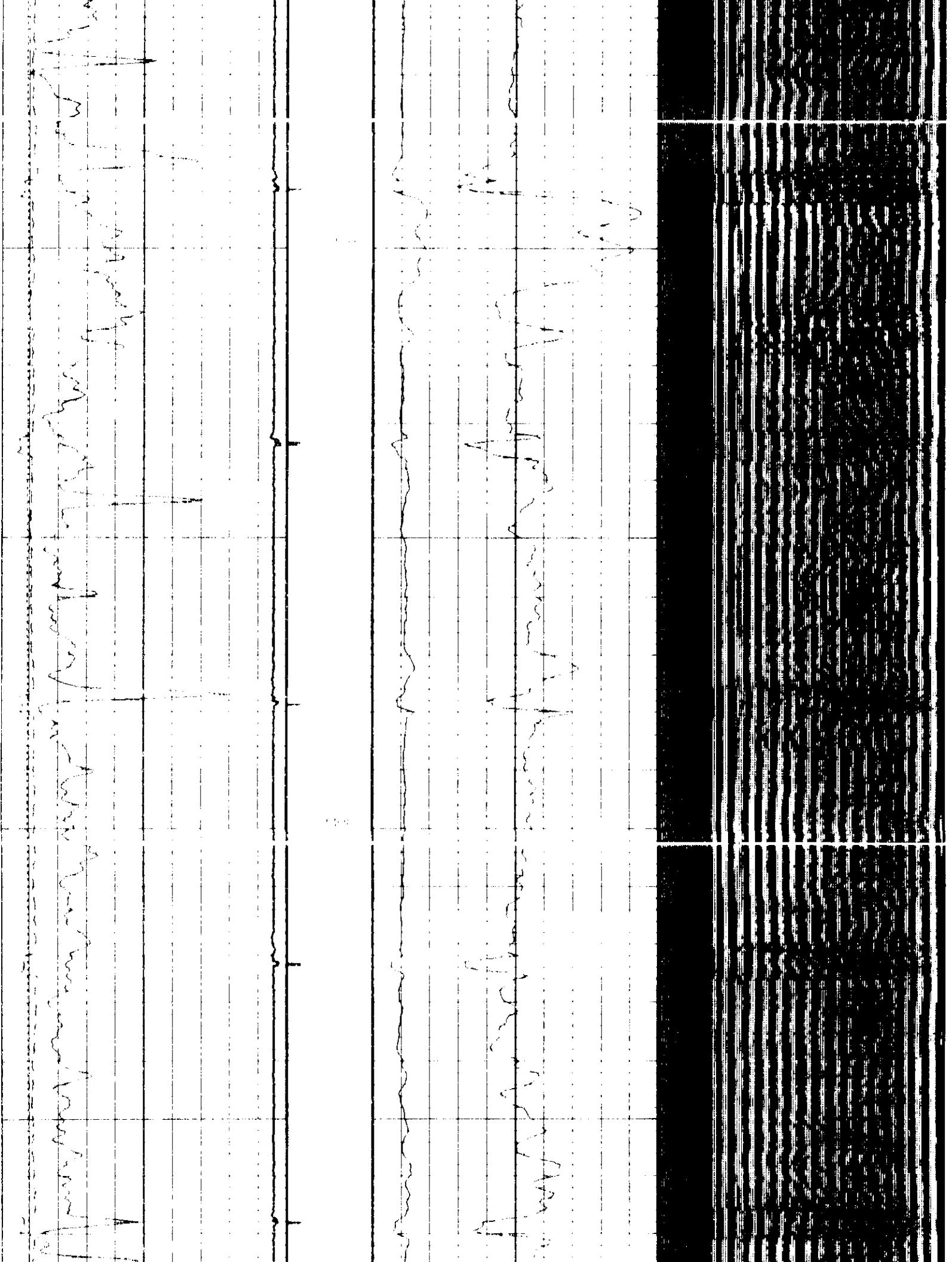
1960-07-10 2:45 PM - 3:00 PM

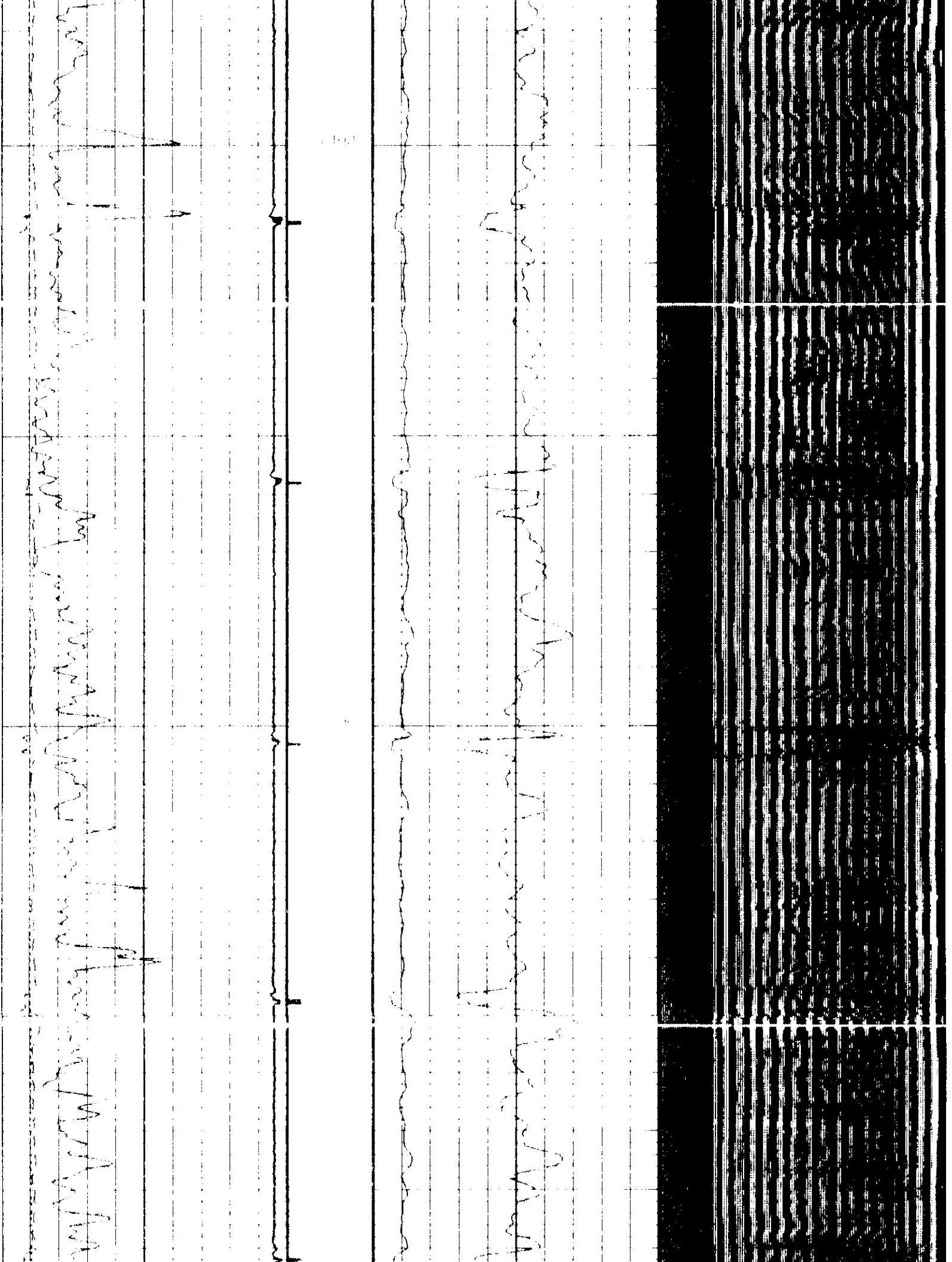
1960-07-10 3:00 PM - 3:15 PM

1960-07-10 3:15 PM - 3:30 PM

1960-07-10 3:30 PM - 3:45 PM

1960-07-10 3:45 PM - 4:00 PM

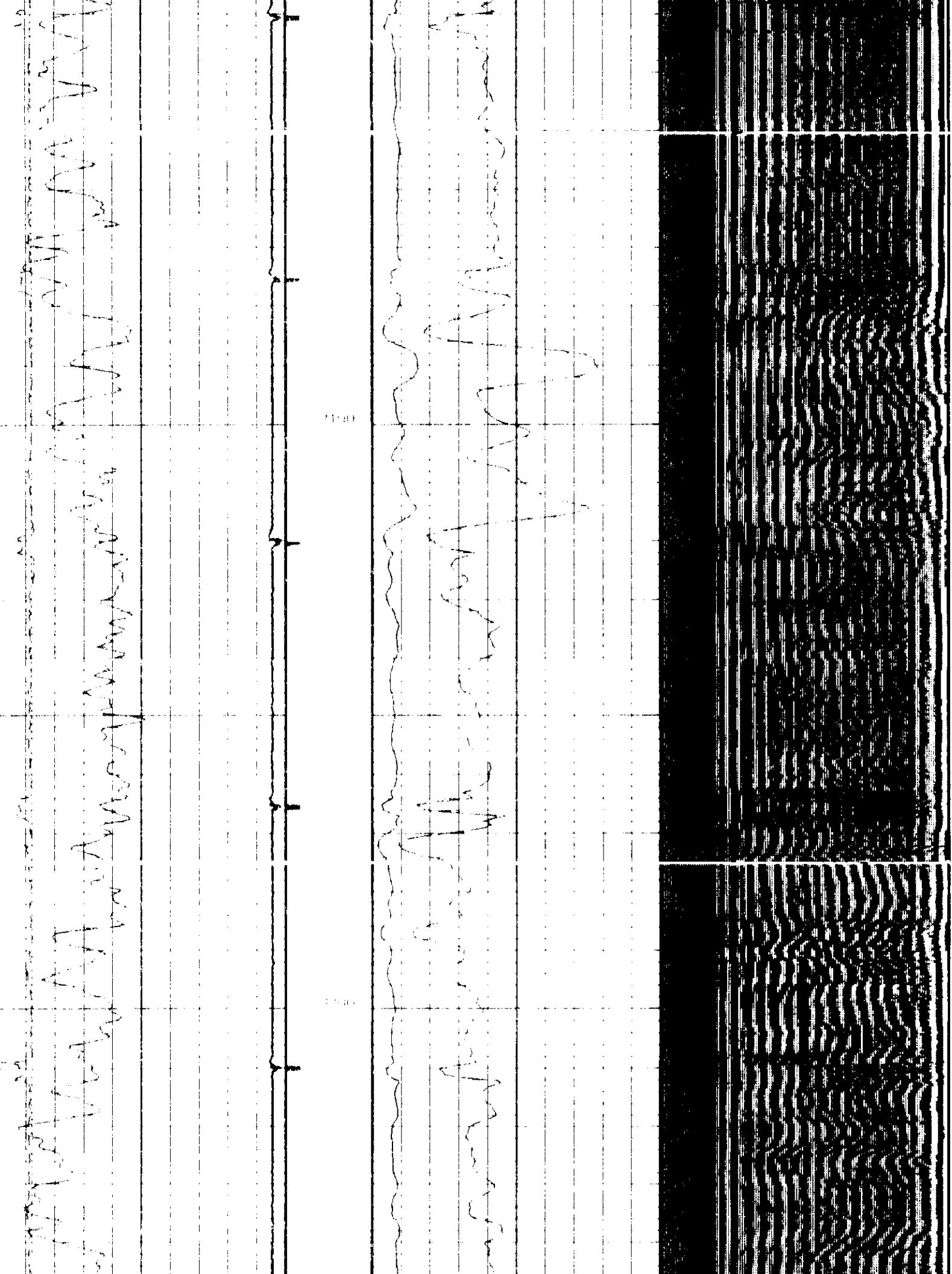


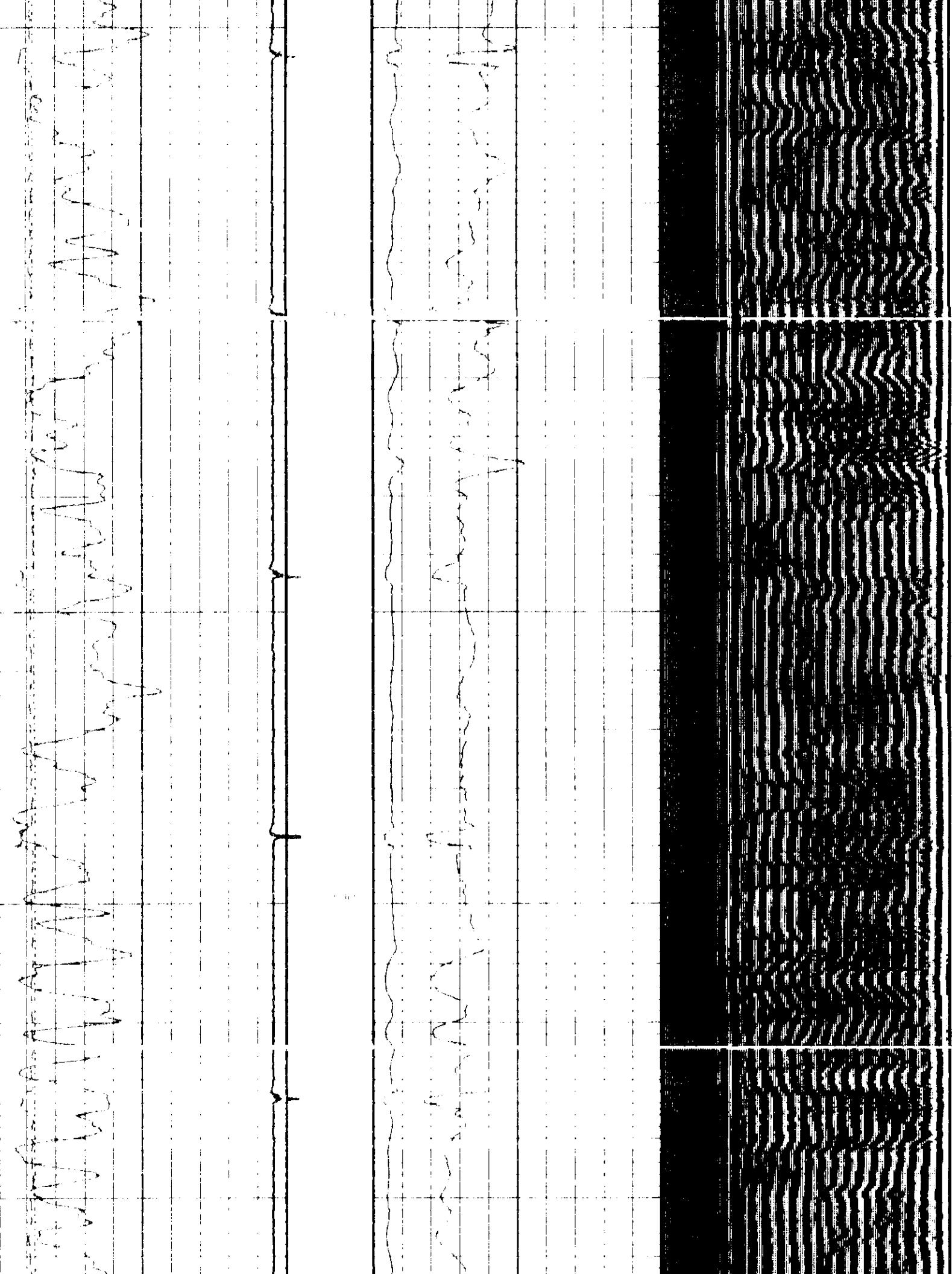


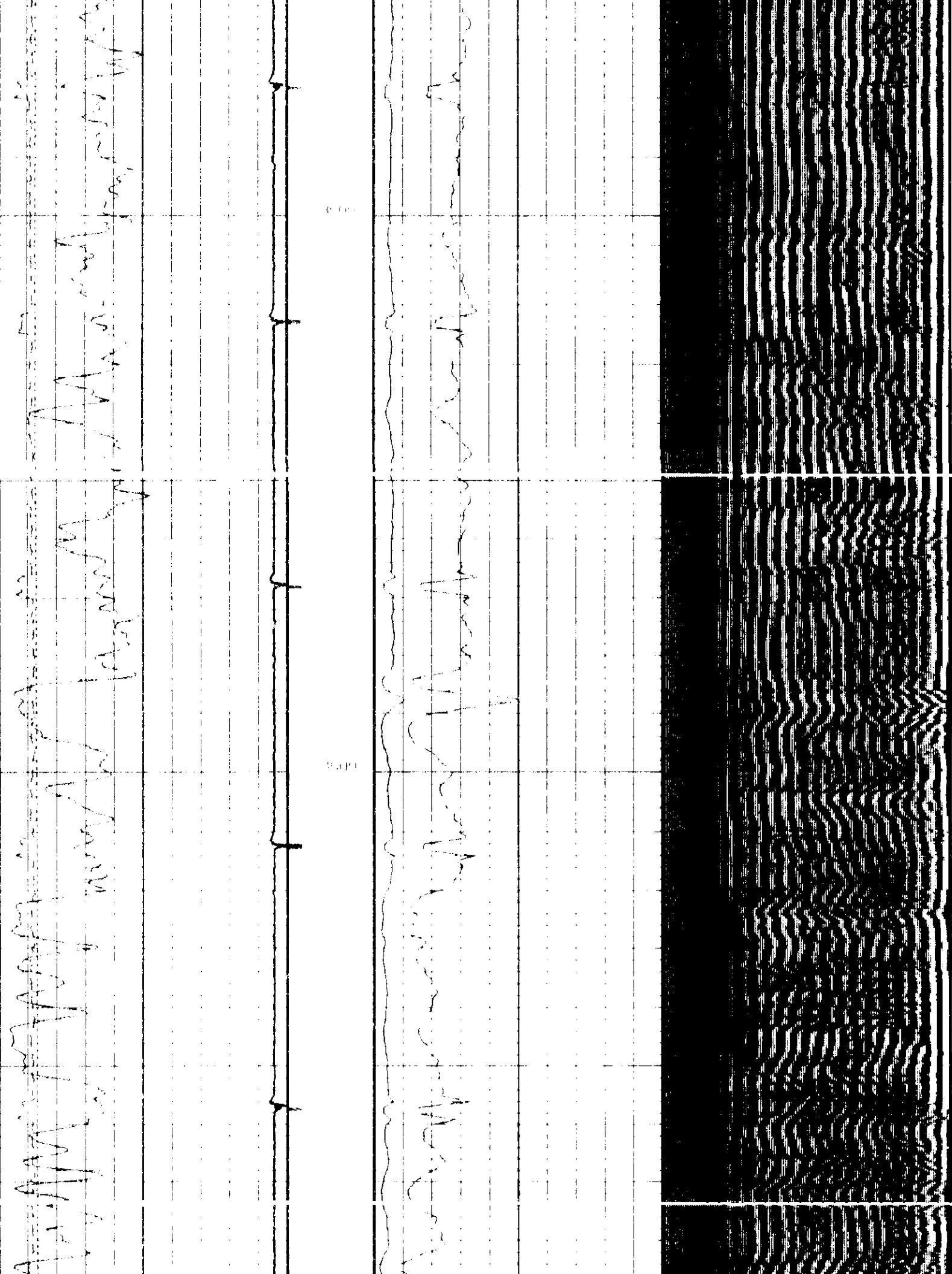
BP OF A CHILD WHO STOPPED

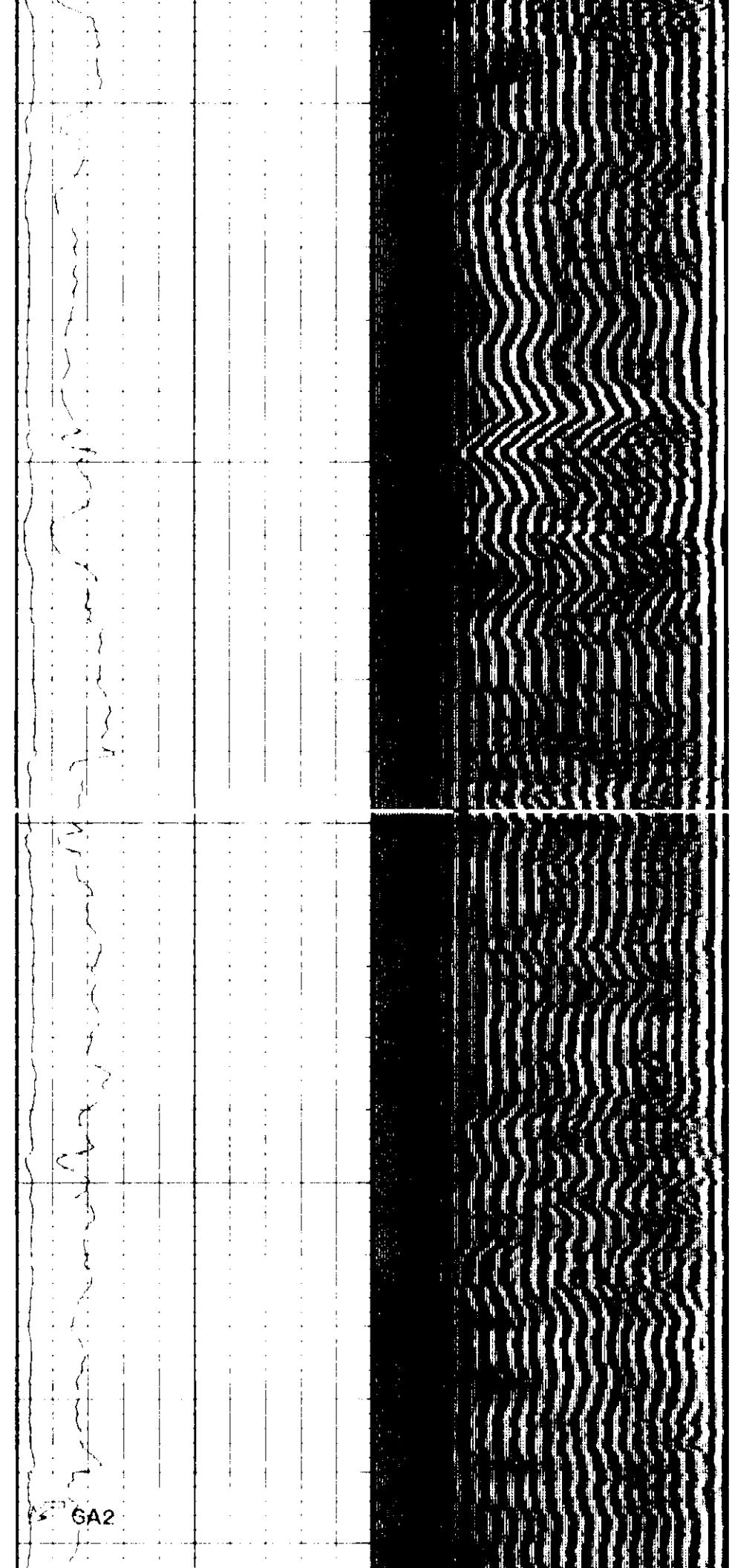
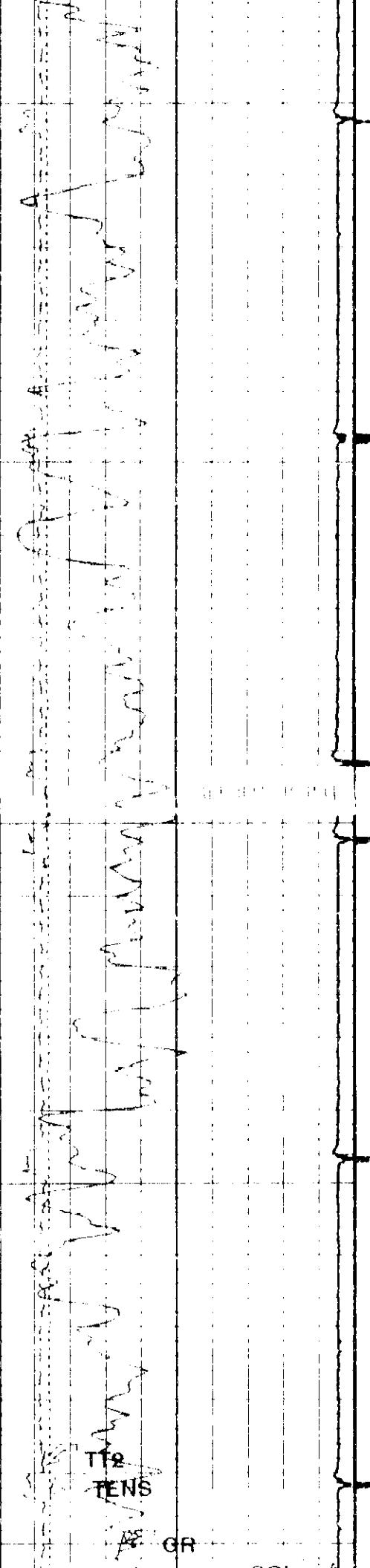
100 110 120 130 140 150 160 170 180 190 200

100 110 120 130 140 150 160 170 180 190 200





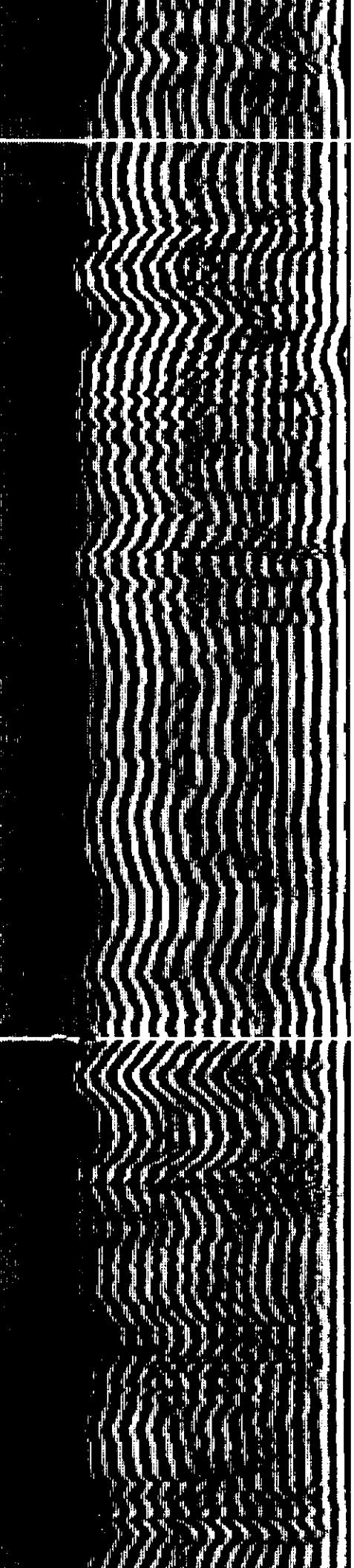


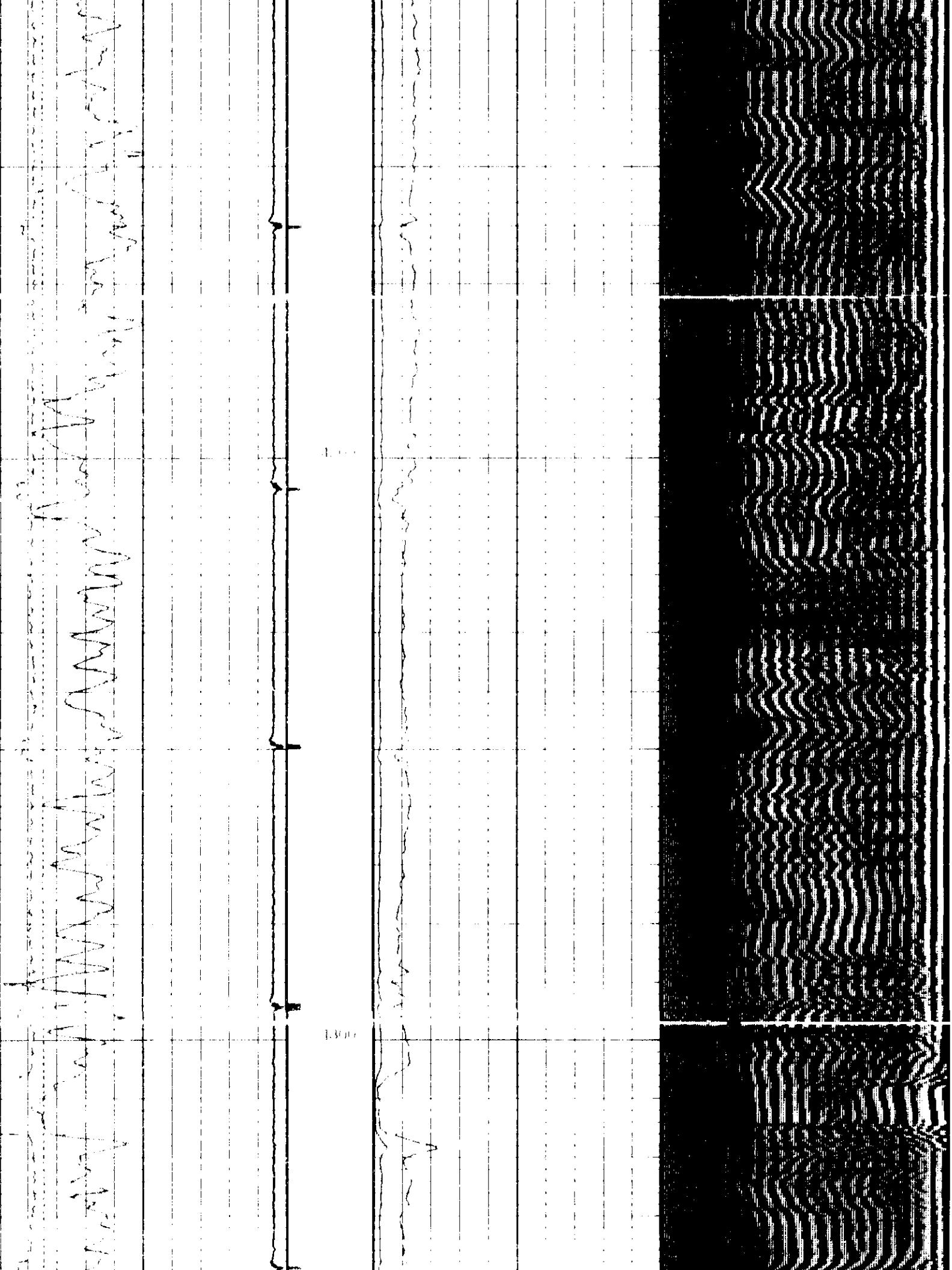


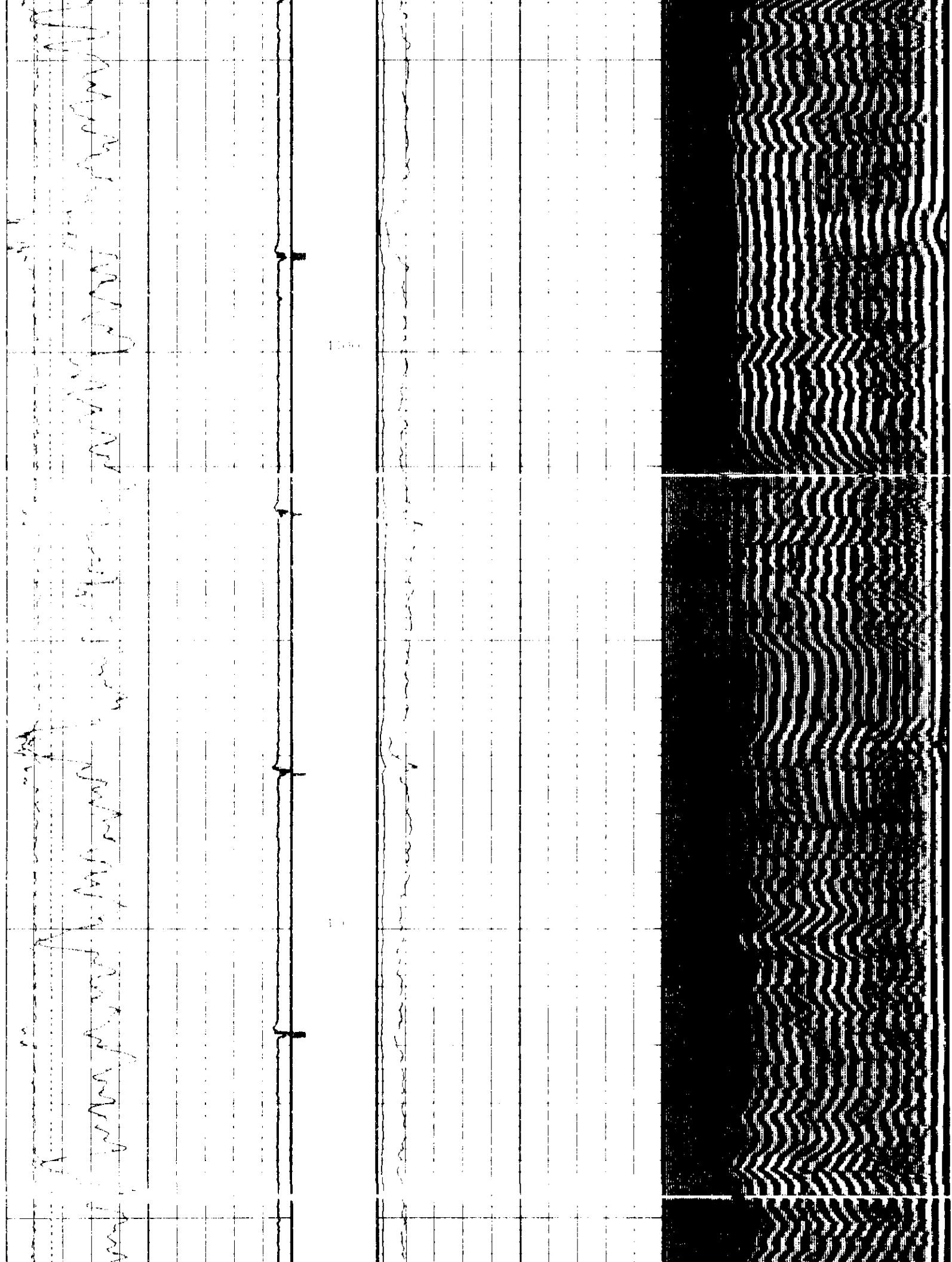
SA2

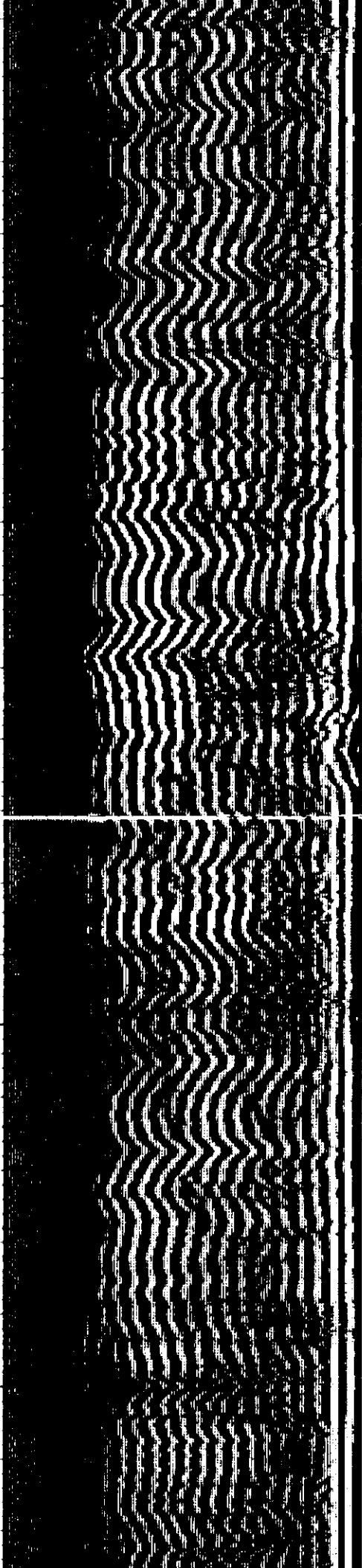
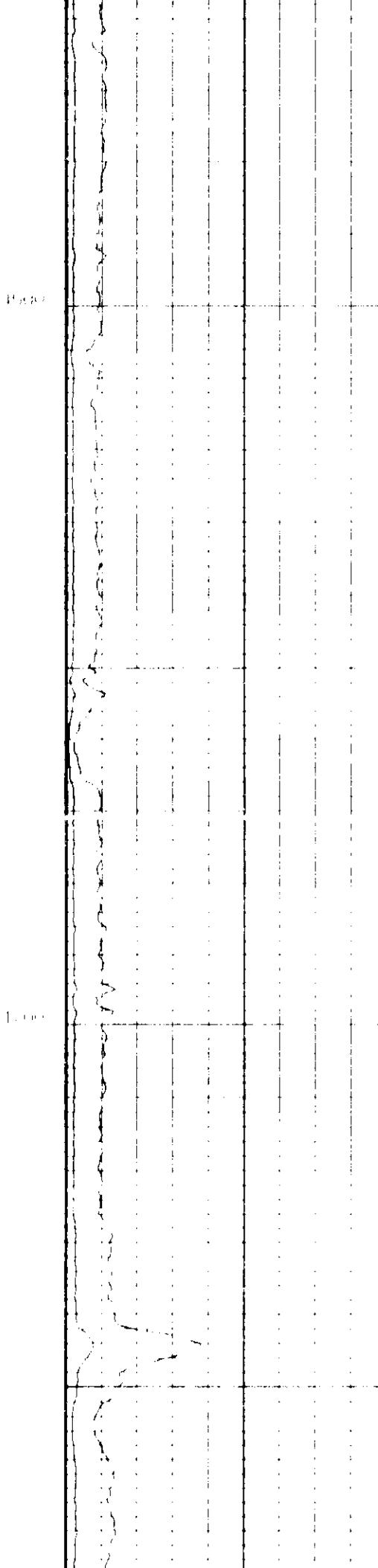
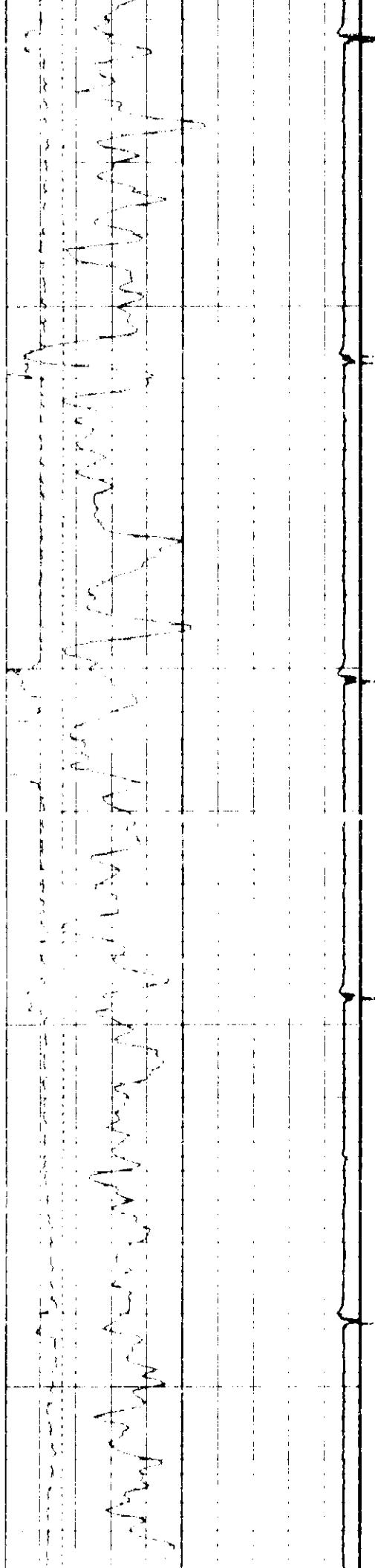
1000

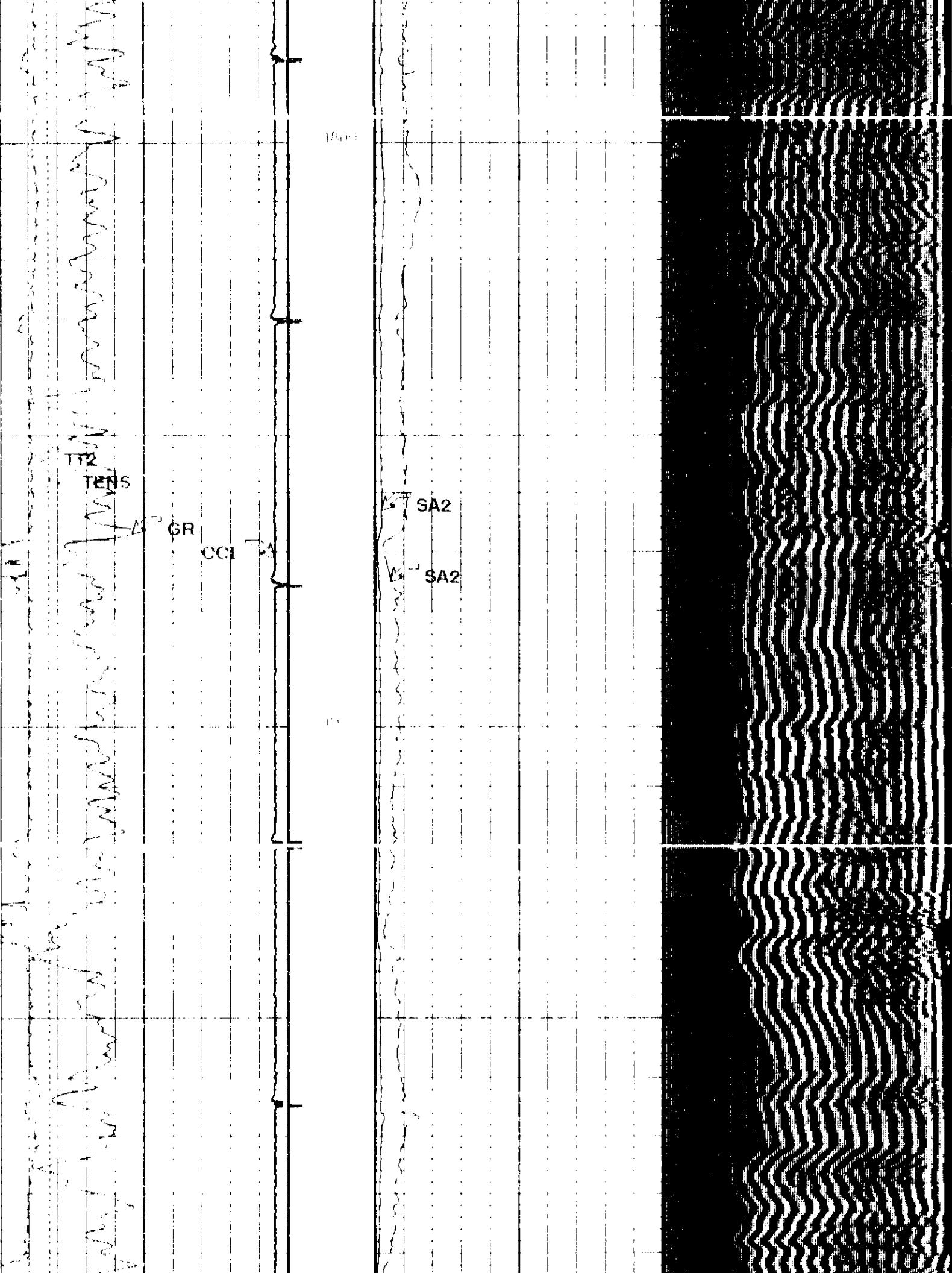
1100



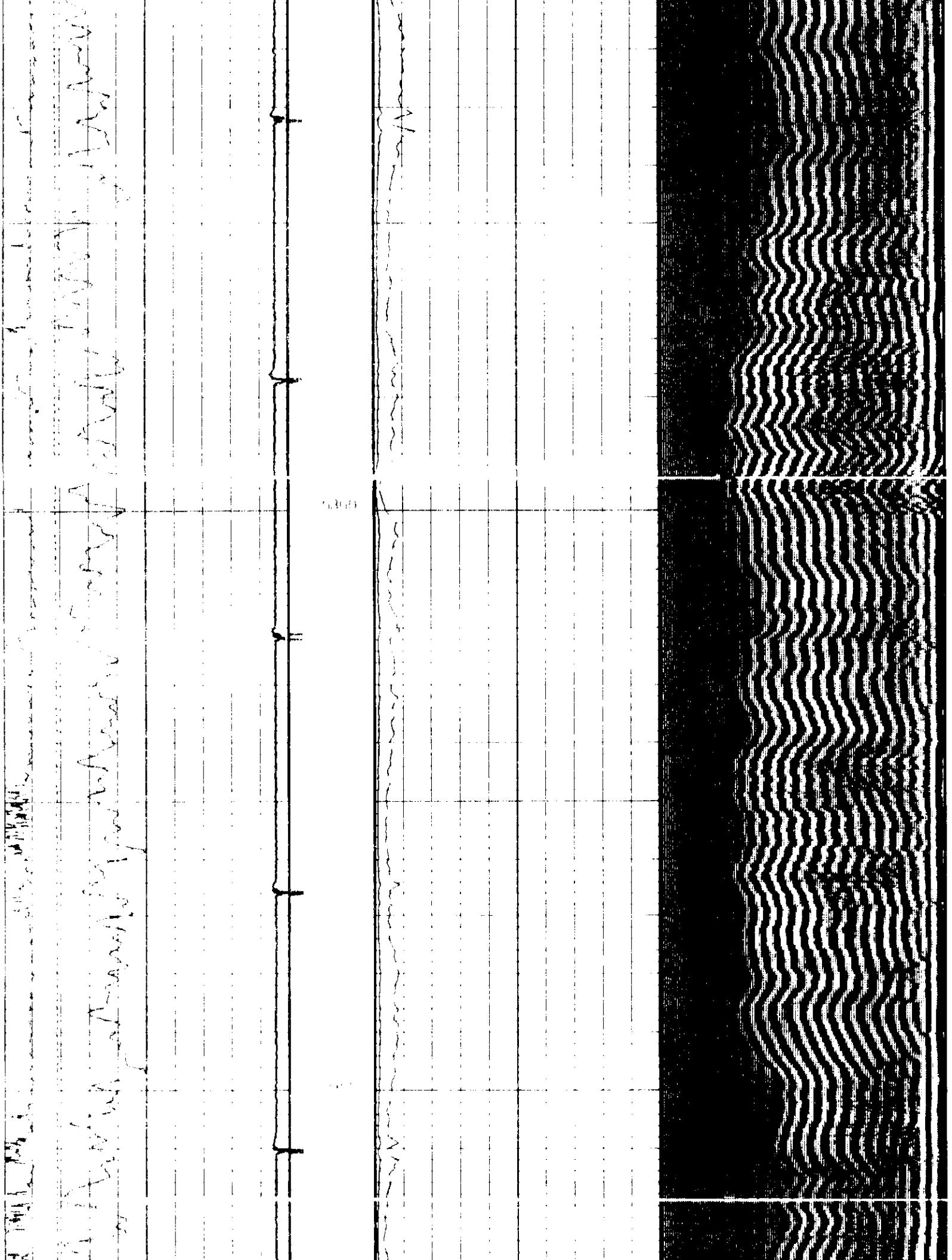


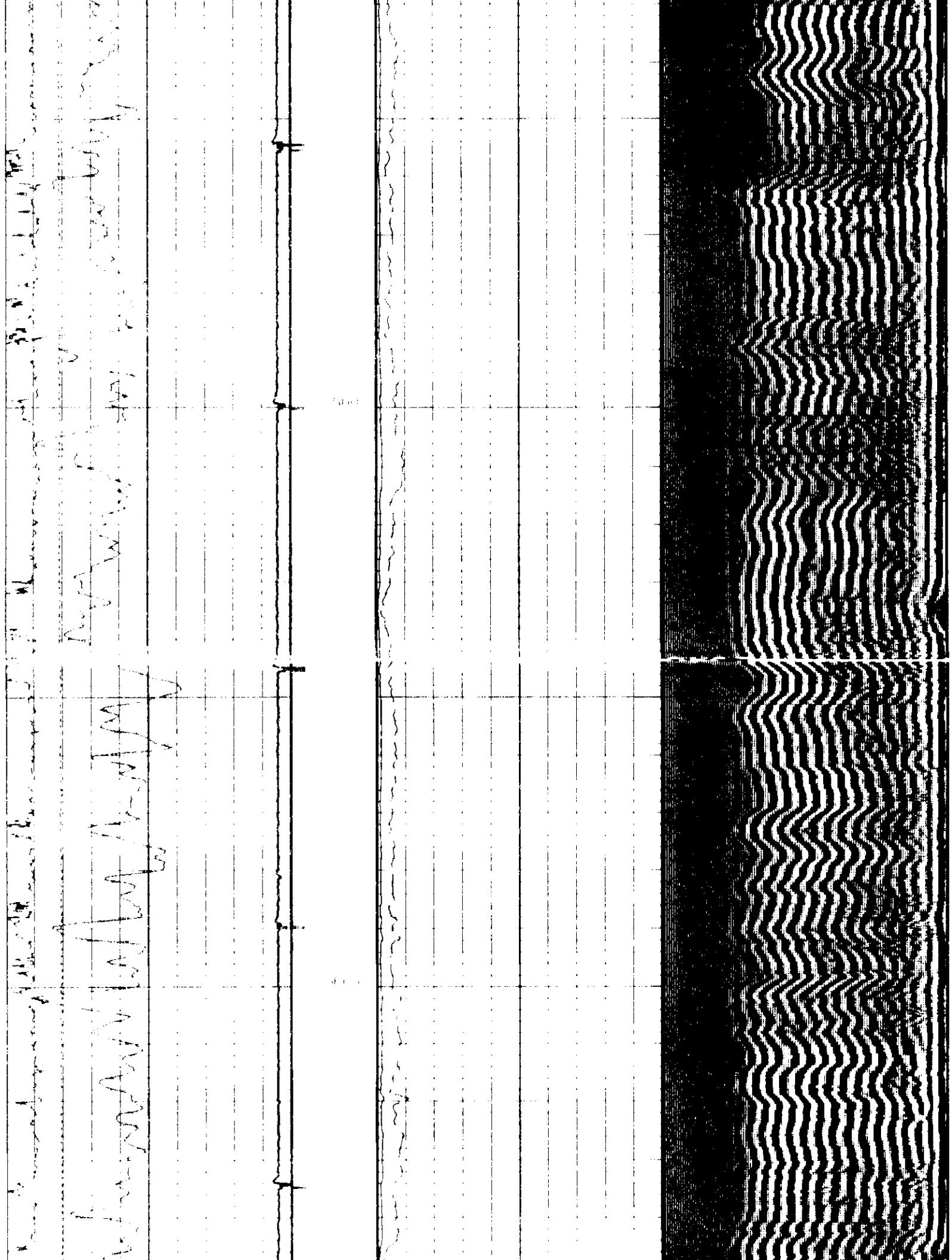


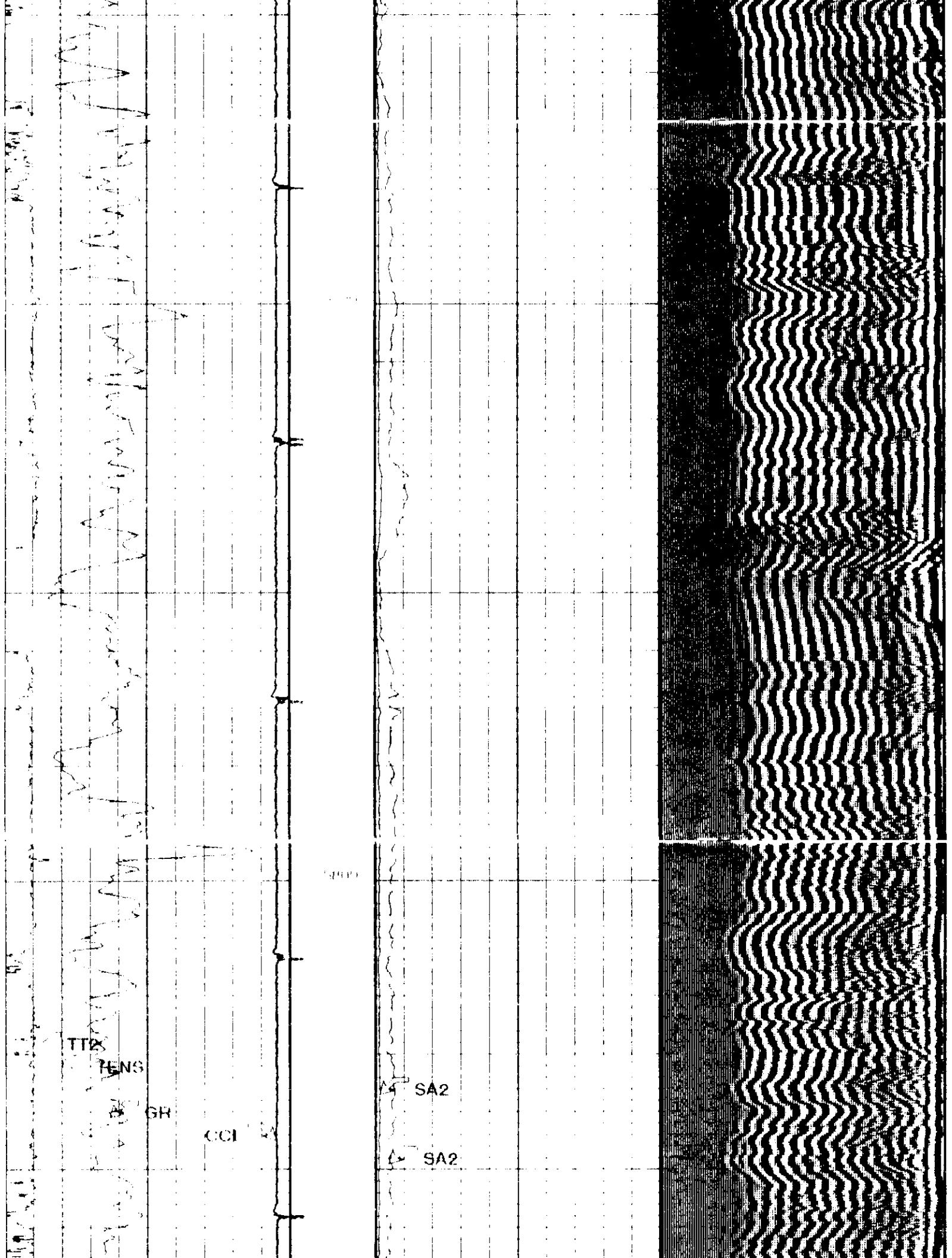


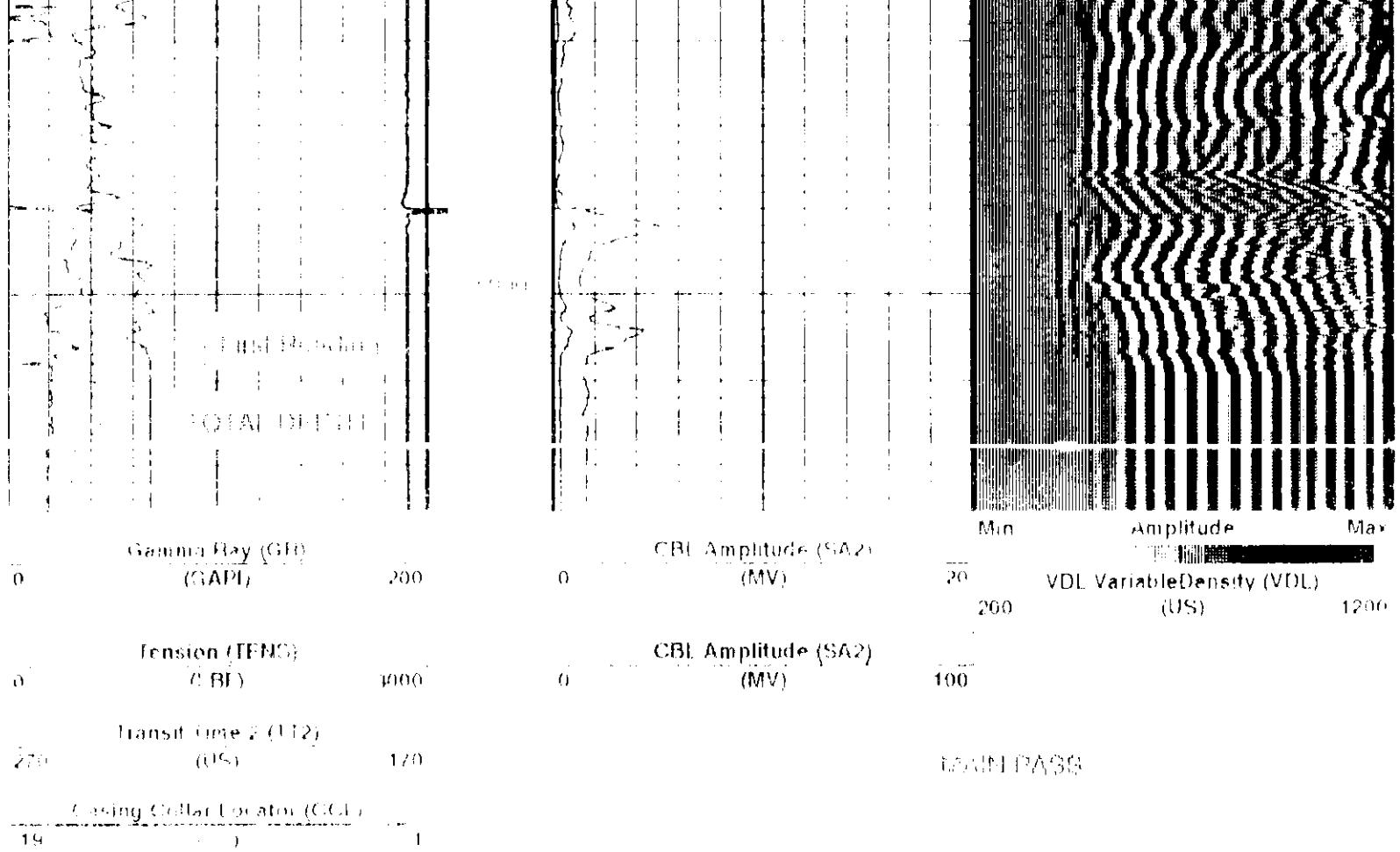


NOTE A CLEARANCE IS STOPPED









Gamma Bay (GAPI)
0 200

CBL Amplitude (SA2)
0 (MV)

Min **Amplitude** **Max**
20 VDL VariableDensity (VDL)
200 (US) 1200

Tension (TENS)
0 1000

CBL Amplitude (SA2)
0 (MV)

100

Transit Time 2 (TT2)
200 (US) 170

TRANSIT TIME

Casing Collar Locator (CCL)
19 (US) 1

PIP SUMMARY

■ Casing Collars

Parameters

DLIS Name	Description	Value
CCLD	CCL reset delay	12 IN
CCLF	CCL detection level	0.3 V
Format_CBL_MFR	Vertical Scale: 5' per 100'	Graphics File Created: 13 Mar-1998 12:11

OP System Version: 8C0-609 MCM

SLEJ	8C0-609	SGT G	8C0-609
CCL AJ	APCW 97Q2		

Output DLIS Files

DEFAULT	SLEJ .006	EN	FIELD	13-Mar-1998 12:11
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Output DLIS Files

DEFAULT	SLEJ .006	EN	FIELD	13-Mar-1998 12:01	5925.5 FT	5660.0 FT
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OP System Version: 8C0-609 MCM

SLEJ	8C0-609	SGT G	8C0-609
CCL AJ	APCW 97Q2		

PIP SUMMARY

■ Casing Collars

Casing Collar Locator (CCL)
19 (US) 1

10 (US) 1

Transit Time 2 (T12)
(US) 270

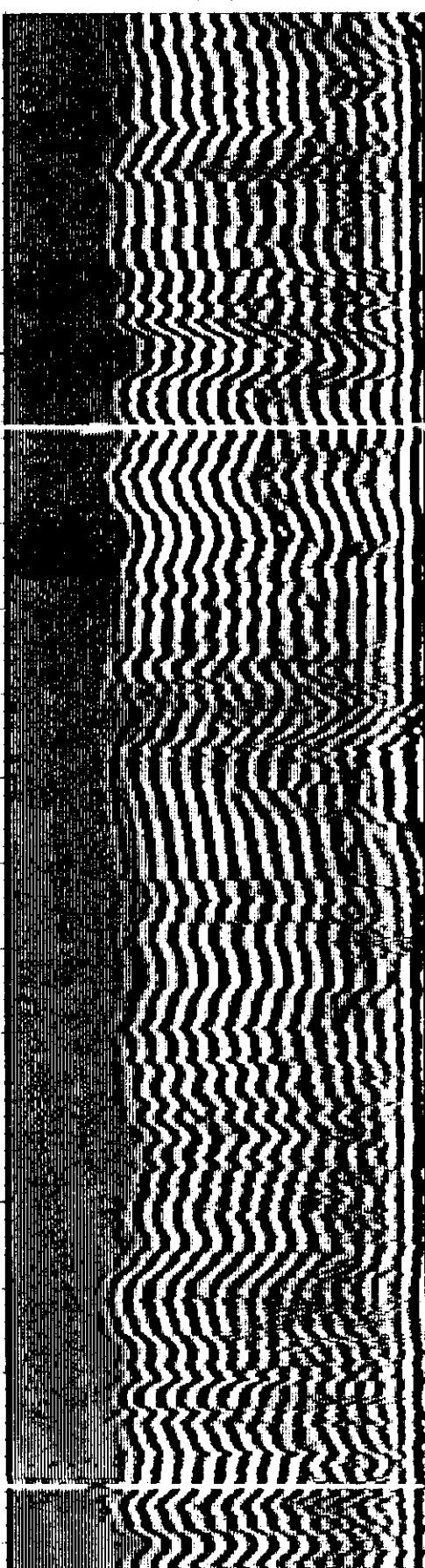
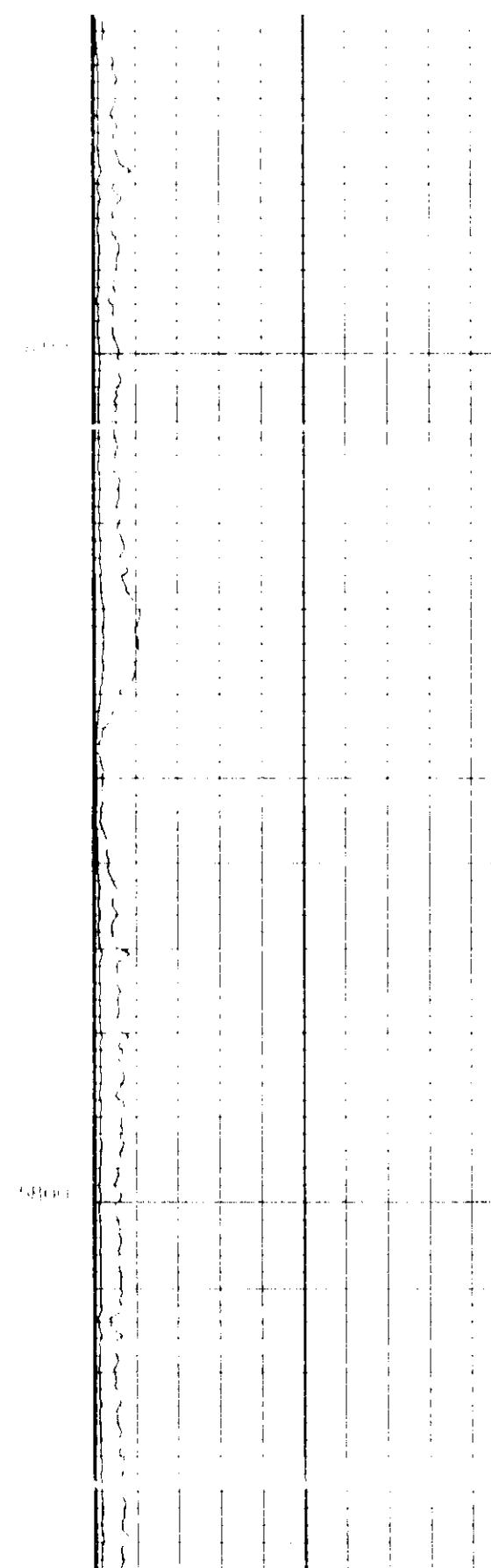
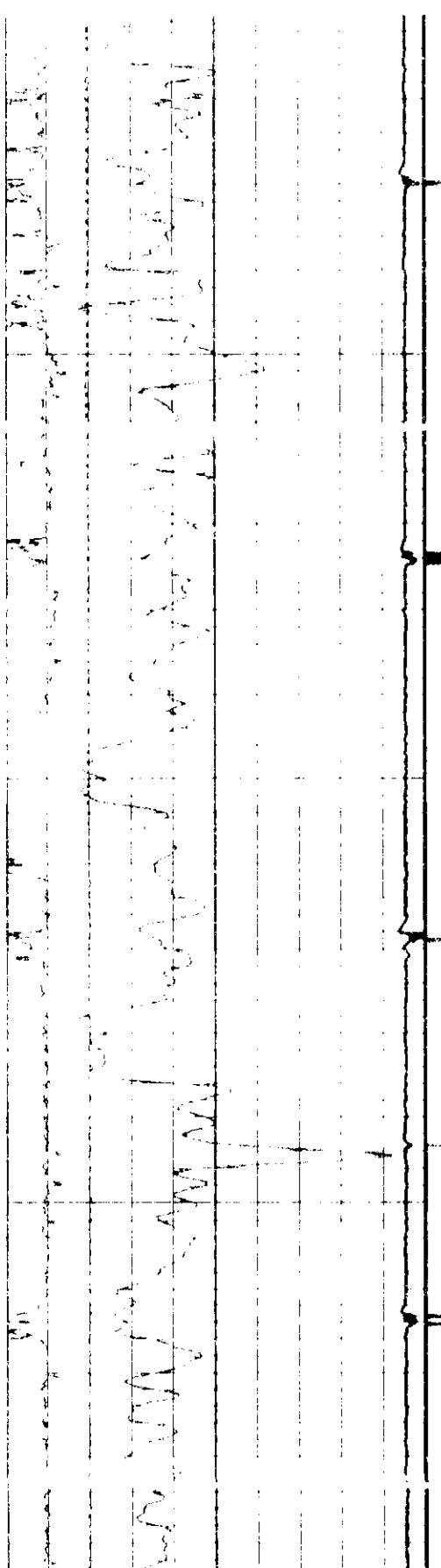
Tension (TENS)
(BU) 0 4000

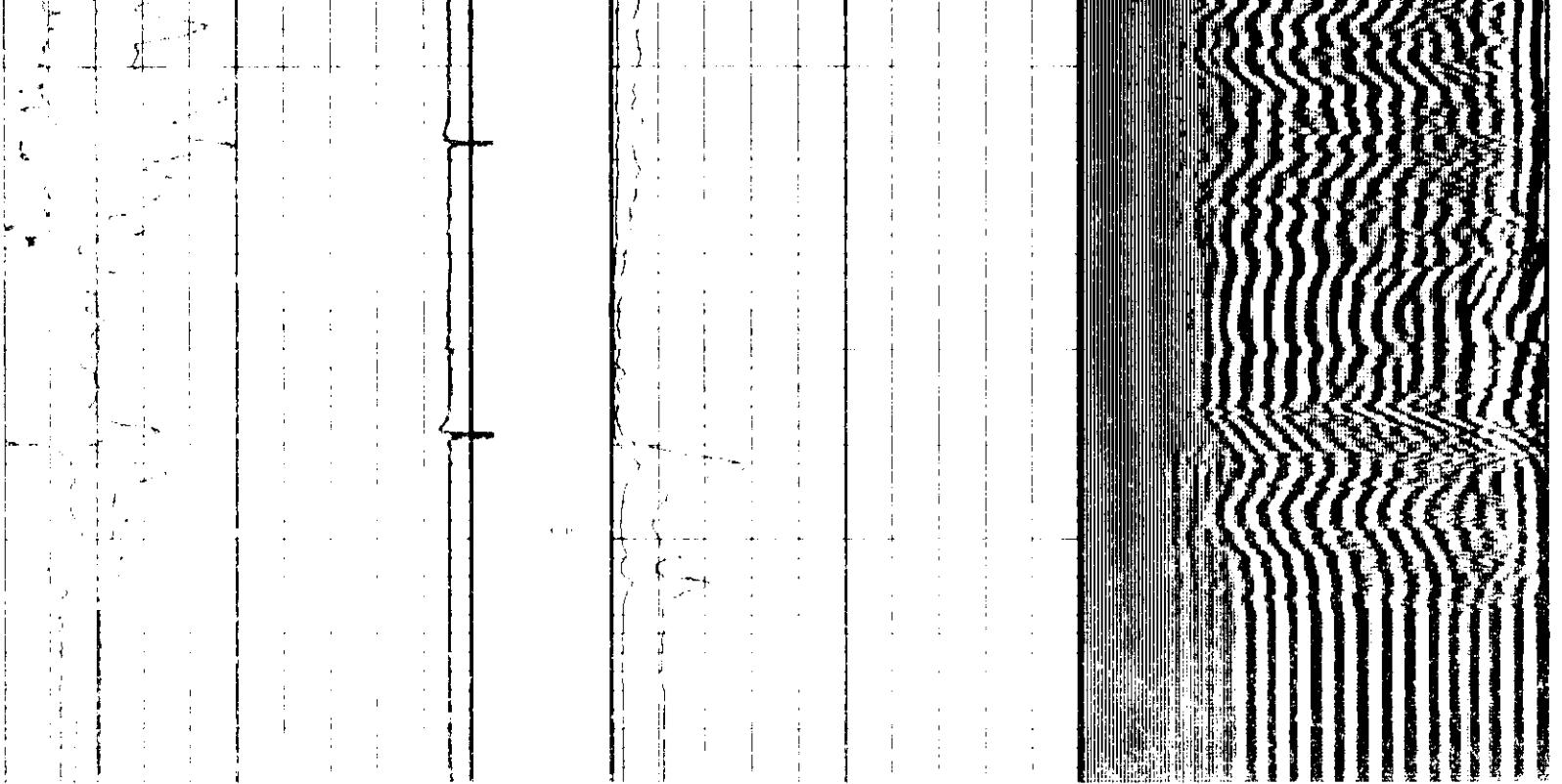
Gamma Ray (GR)
(GAPI) 0 200

CBL Amplitude (SA2)
(MV) 0 100

CBL Amplitude (SA2)
(MV) 0 100

Min Amplitude Max
20 VDL Variable Density (VDL)
200 (US) 1200





Acquisition Day (GAI)

(GAI)

200

CBI Amplitude (SA2)

(MV)

Min

Ampitude

MV

Transit Time 1 (TT1)

(CBI)

4000

CBI Amplitude (SA1)

(MV)

Max

VDR Variable Density (MV)

MV

Transit Time 2 (TT2)

(US)

176

100

Casing Collar Counter (CC)

(CC)

1

Printed on 13 Mar 1998 12:01

PIP SUMMARY

E - Casing Collars

Parameters

DLIS Name	Description	Value
CCLD	CC1 reset delay	12 IN
CCLT	CC1 detection level	0.3 V
Format: CBI VDI	Vertical Scale: 5" per 100'	Graphics File Created: 13 Mar 1998 12:01

OP System Version: 8C0-609
MCM

SET I	RC 0 615	SGT-G	8C0-609
CCU AJ	APCW 9712		

Output DLIS Files

DEFAULT	SET I 000	EN 5	FIELD	13-Mar-1998 12:01
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COMPANY: PETROGLYPH OPERATING COMPANY

WELL: UTE TRIBAL 31-07
FIELD: ANTELOPE CREEK
COUNTY: DUCHESNE

File Type:	DLIS
File ID:	000
File Date:	13-Mar-1998 12:01
File Version:	8C0-609
File Size:	1000000000

STATE OF UTAH

CEMENT BOND LOG
GAMMA RAY
CCI
Schlumberger

CEMENT BOND LOG
GAMMA RAY
CCI

ATTACHMENT NO. 8

OPEN HOLE LOG FOR THE UIC WELL

COMPANY: PETROGLYPH OPERATING
COMPANY INC.

WELL:
UTE TRIBAL 31-07

FIELD:
ANTELOPE CREEK

COUNTY: DUCHESNE STATE: UTAH

Schlumberger
LITHODENSITY
GAMMA RAY

COUNTY:	DUCHESE		
Field:	ANTELOPE CREEK		
Location:	1976' FNL & 2168' FEL		
Company:	UTE TRIBAL 31-07		
LOCATION			
Permanent Datum:	GROUND LEVEL		
Log Measured From:	KELLY BUSHING		
Drilling Measured From:	KELLY BUSHING		
API Serial No.	43-013-32036	SECTION	TOWNSHIP
		31	5S
			RANGE
			3W
Logging Date	4-MAR-1998	Logging Date	
Run Number	ONE	Run Number	
Depth Driller		Depth Driller	
Schlumberger Depth	6063 F	Schlumberger Depth	
Bottom Log Interval	6046 F	Bottom Log Interval	
Top Log Interval	6030 F	Top Log Interval	
Casing Driller Size @ Depth	275 F	Casing Driller Size @ Depth	
Casing Schlumberger	8 785 IN	Casing Schlumberger	
Bit Size	275 F	Bit Size	
Type Fluid In Hole	AMMONIUM CHLORIDE	Type Fluid In Hole	
MUD Density	8.3 LB/G	MUD Density	
Fluid Loss	27 S	Fluid Loss	
Source Of Sample	PH	Source Of Sample	
RM @ Measured Temperature	4.290 OHMM	RM @ Measured Temperature	@
RMF @ Measured Temperature	4.290 OHMM	RMF @ Measured Temperature	@
RMC @ Measured Temperature	@	RMC @ Measured Temperature	@
Source RMF	RMC	Source RMF	RMC
RM @ MRT	RMF @ MRT	RM @ MRT	RMF @ MRT
Maximum Recorded Temperatures	1.899 @ 126	Maximum Recorded Temperatures	@
Circulation Stopped	126 DEGF	Circulation Stopped	
Logger On Bottom	Time	Logger On Bottom	Time
Unit Number	8426	Unit Number	8426
Recorded By	K NELSON & F. ORTIZ	Recorded By	CHUCK WHITE
Witnessed By		Witnessed By	

Run 1 Run

Run 3
Run 4

ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

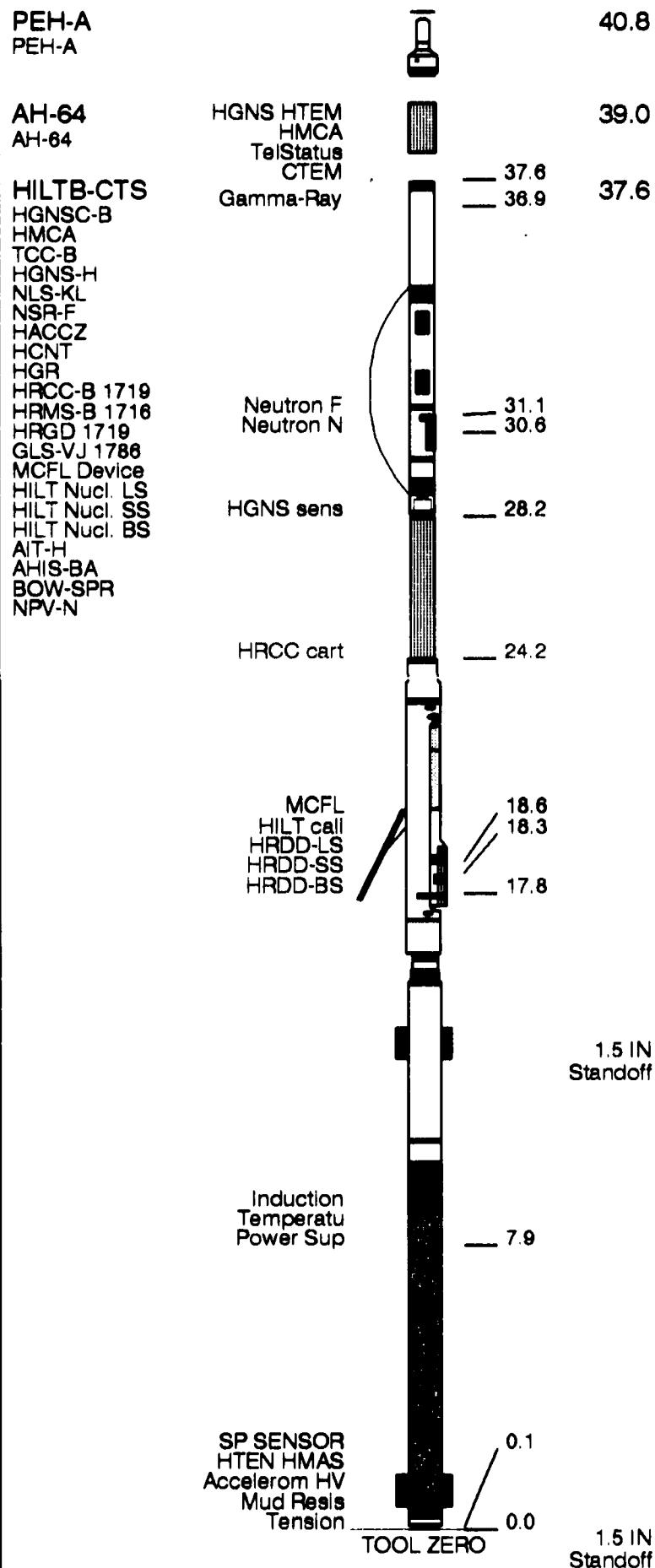
OTHER SERVICES1	OTHER SERVICES2
OS1:	OS1:
OS2:	OS2:
OS3:	OS3:
OS4:	OS4:
OS5:	OS5:
REMARKS: RUN NUMBER 1	REMARKS: RUN NUMBER 2
BOW SPRING USED ON NEUTRON TOOL.	
STANDOFF SIZES WERE 1.5 INCHES.	
CHLORIDES WERE 700PPM.	
PRIMARY DEPTH SYSTEM USED.	
TODAYS CREW WAS:	
K. JOHNS AND B. SLAMA	

AFE# 41488

RUN 1			RUN 2		
SERVICE ORDER #:	1067325		SERVICE ORDER #:		
PROGRAM VERSION:	7C0-712		PROGRAM VERSION:		
FLUID LEVEL:			FLUID LEVEL:		
LOGGED INTERVAL	START	STOP	LOGGED INTERVAL	START	STOP

EQUIPMENT DESCRIPTION

RUN 1	RUN 2
SURFACE EQUIPMENT NCS-VB TCM-AB GSR-U/Y NCT-B CNB-AB	
DOWNHOLE EQUIPMENT	



MAXIMUM STRING DIAMETER 6.88 IN
 MEASUREMENTS RELATIVE TO TOOL ZERO
 ALL LENGTHS IN FEET

Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11	6054.0 FT	78.0 FT
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11	6054.0 FT	78.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2171.45 F3

Cement Volume = 1217.93 F3 (assuming 5.50 IN casing O.D.)

Computed from 6054.0 FT to 275.0 FT using data channel(s) HCAL

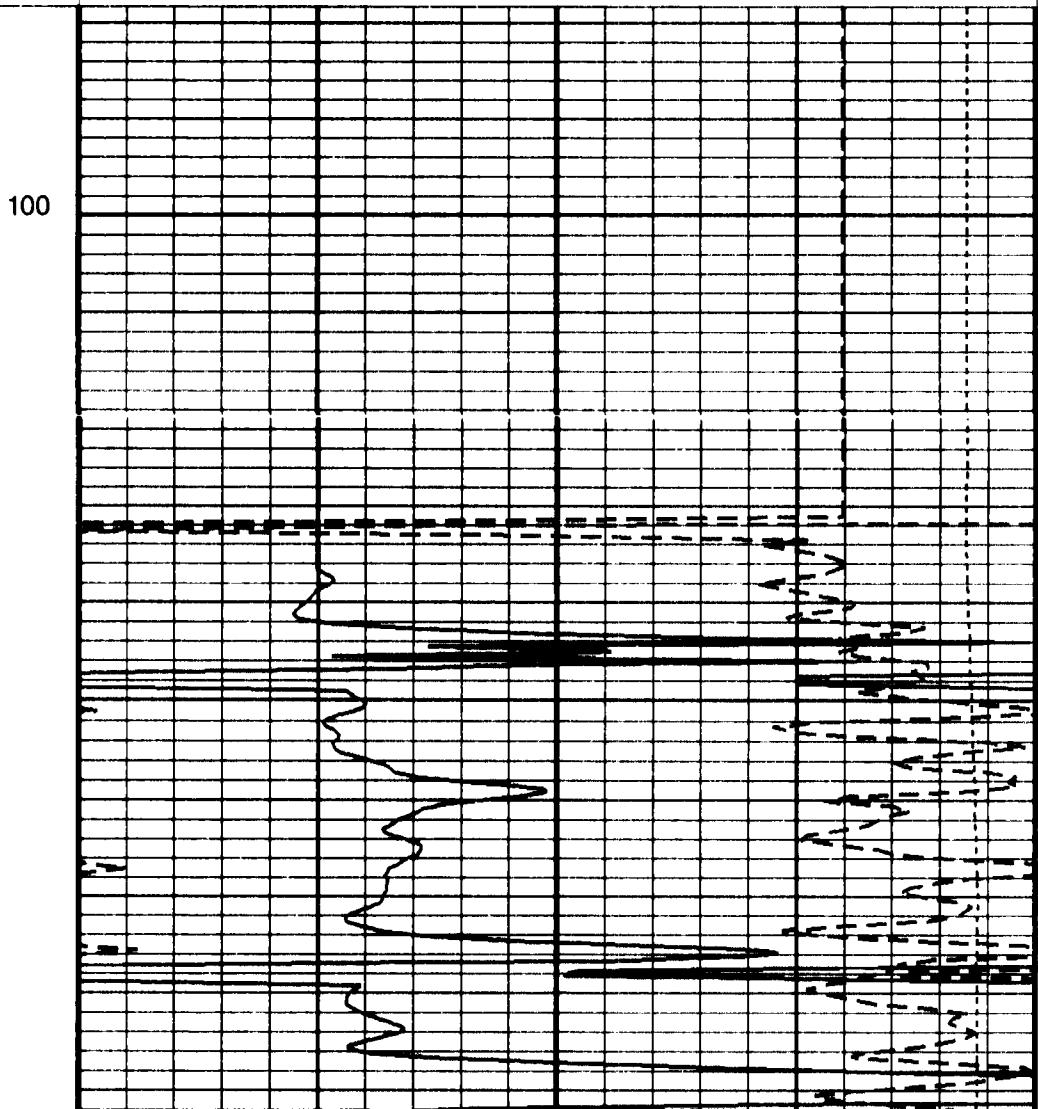
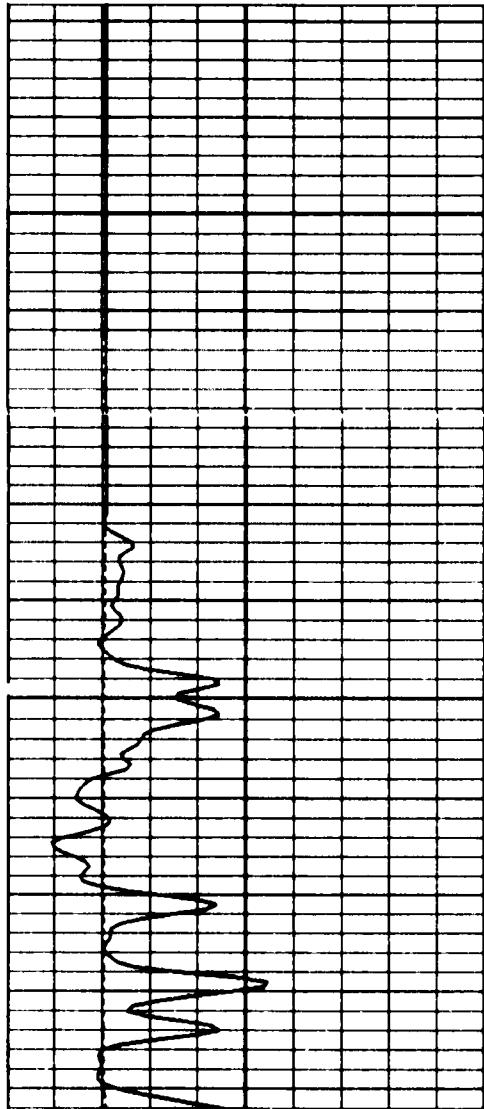
OP System Version: 7C0-712
DBM

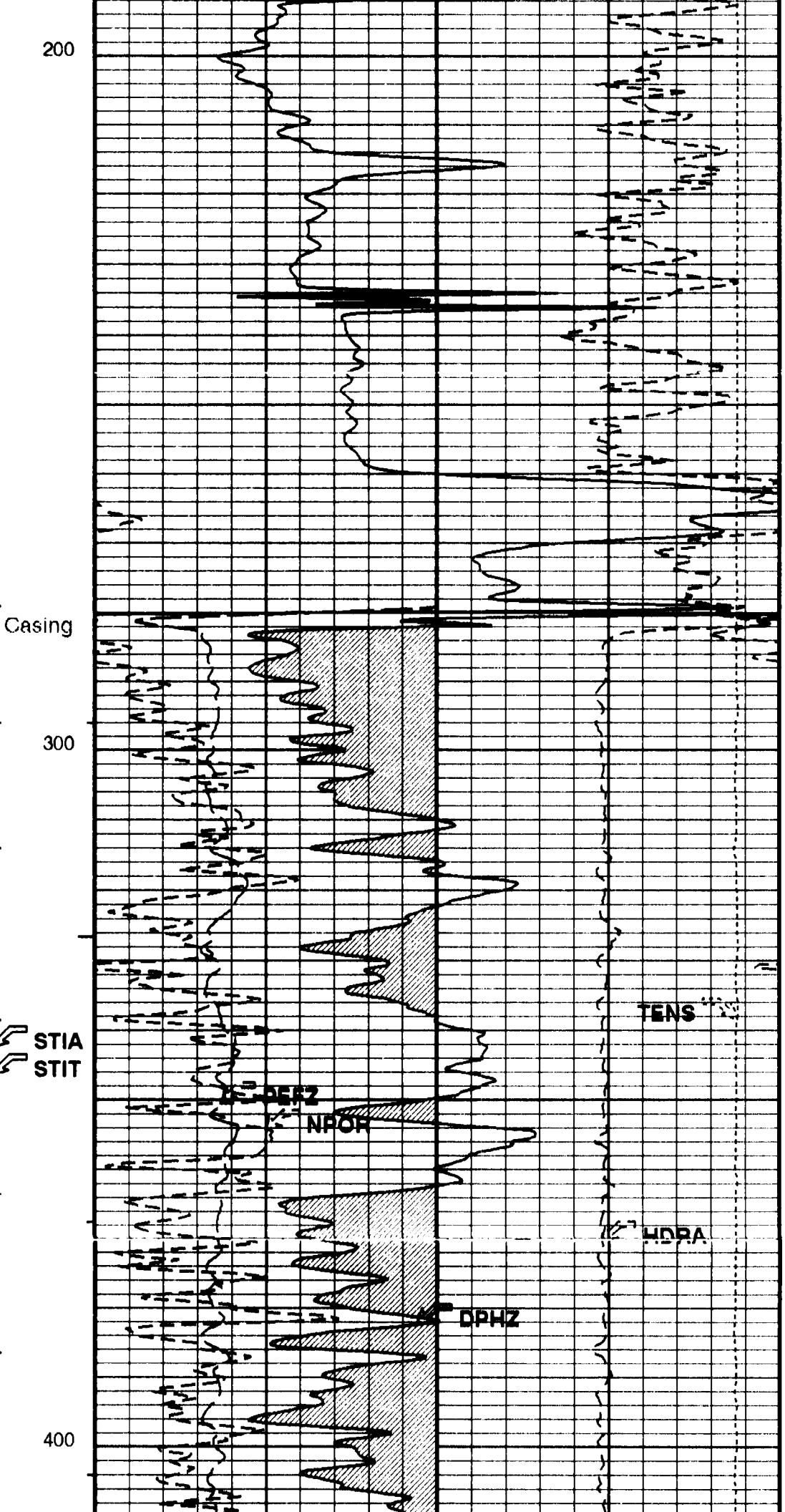
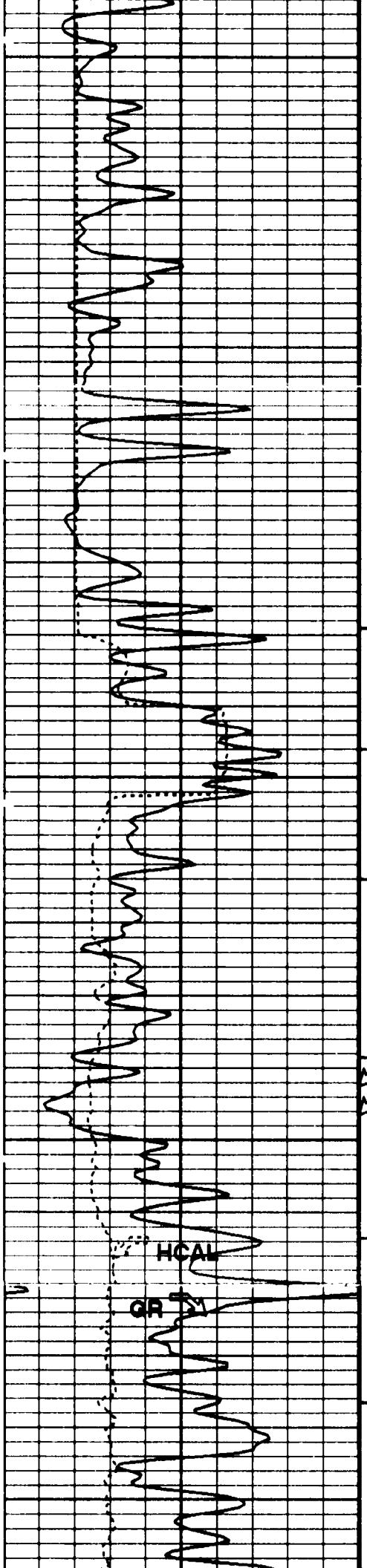
PIP SUMMARY

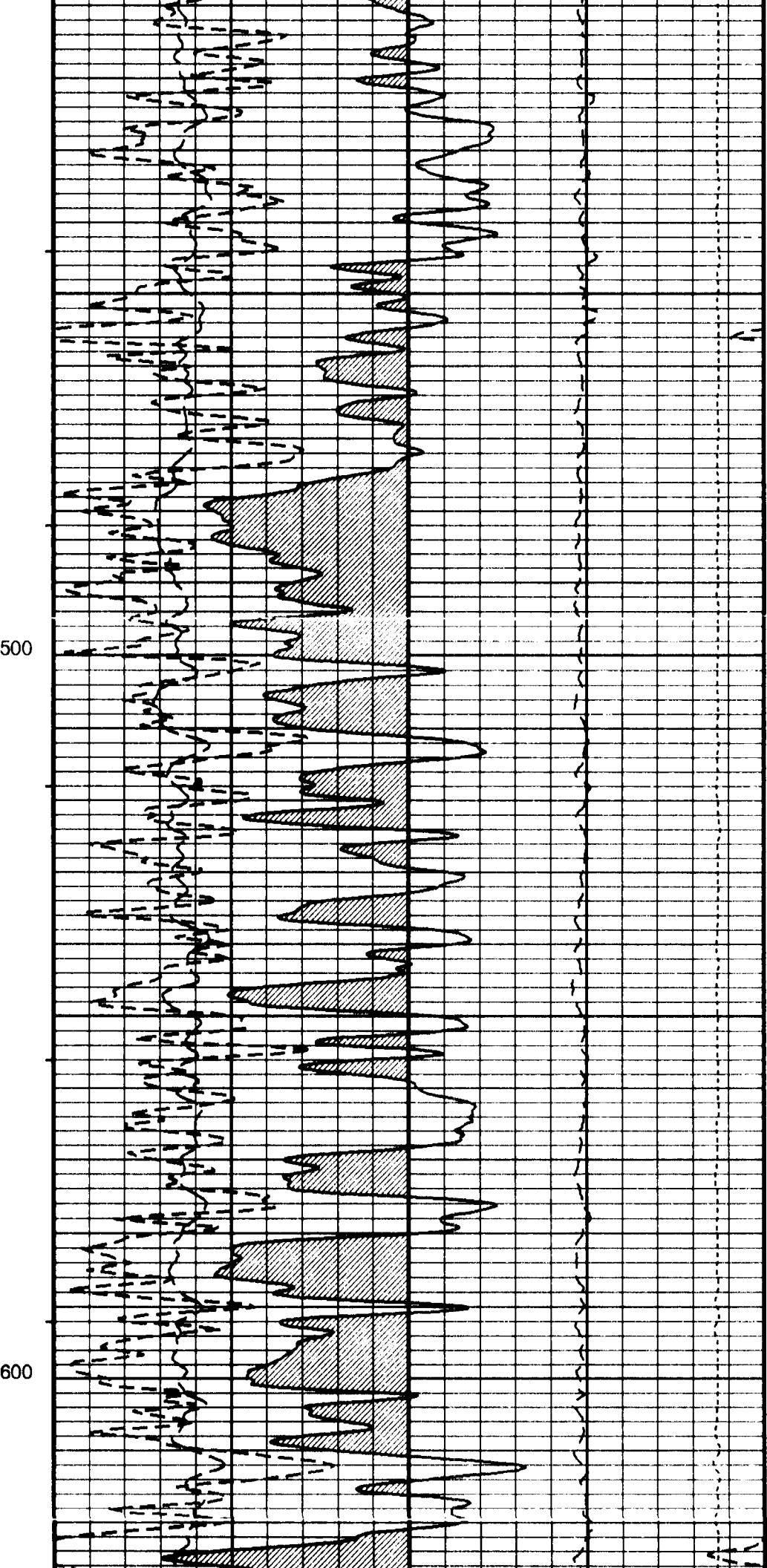
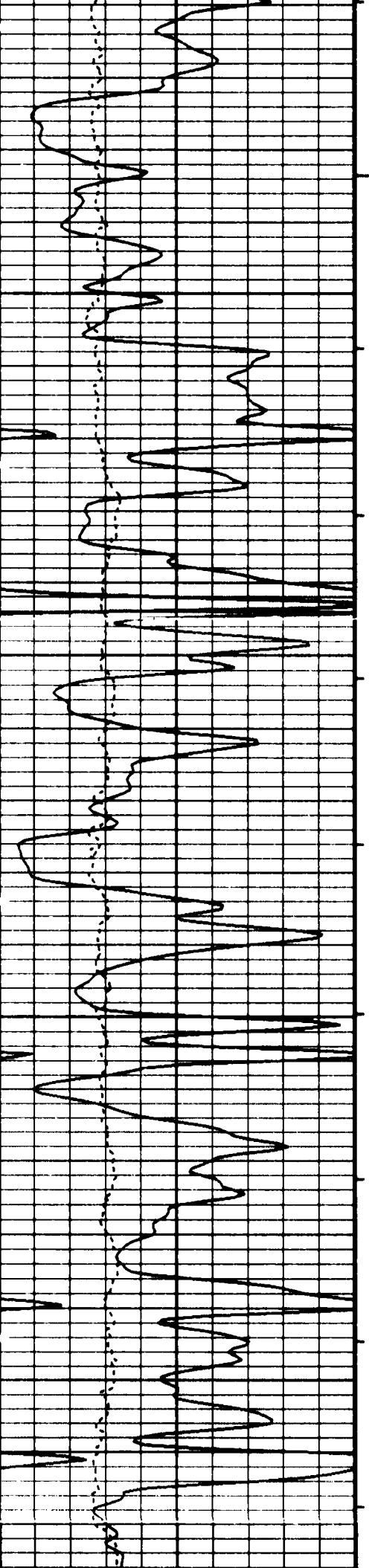
- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - └ Integrated Cement Volume Minor Pip Every 10 F3
 - └ Integrated Cement Volume Major Pip Every 100 F3

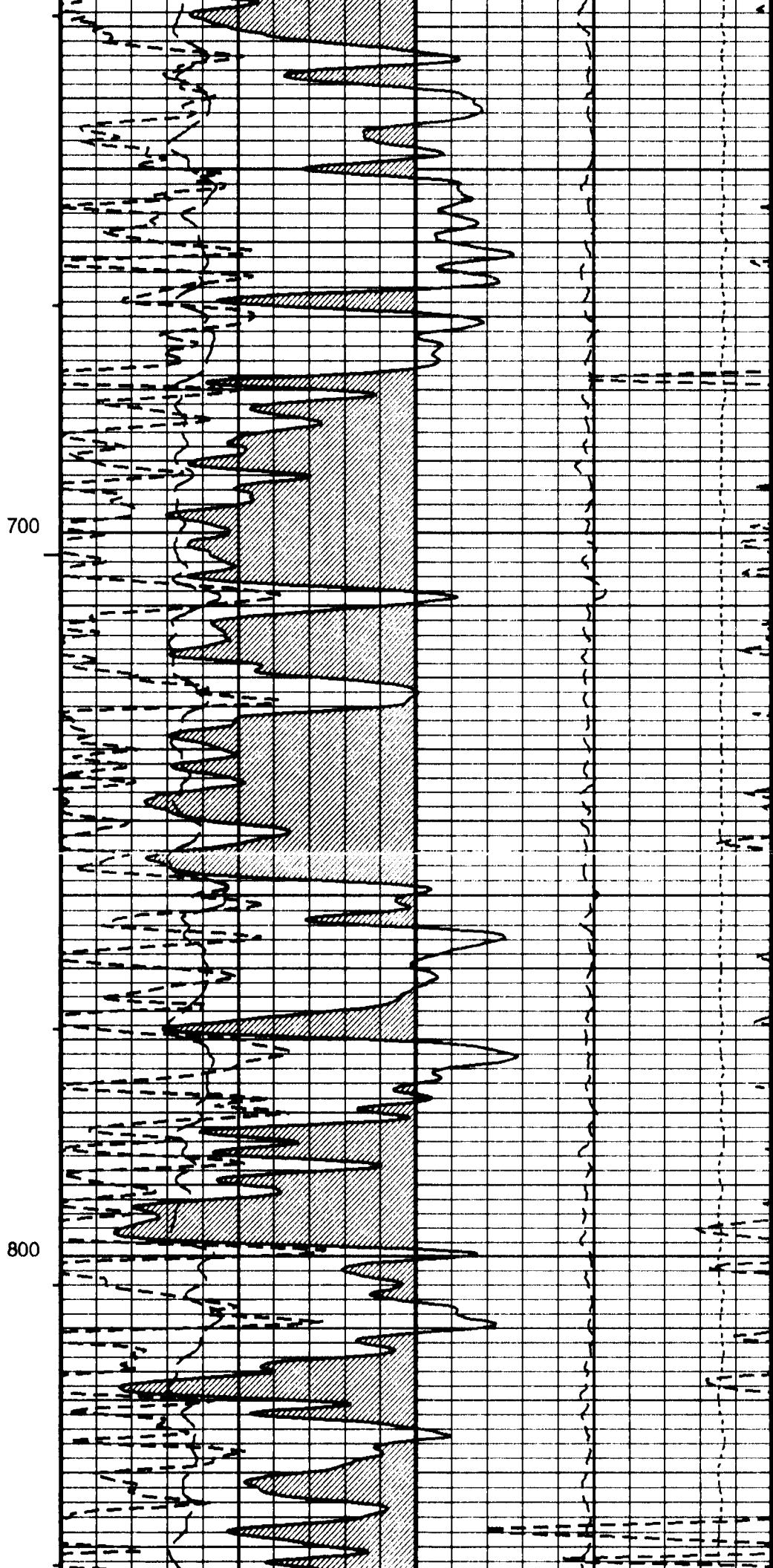
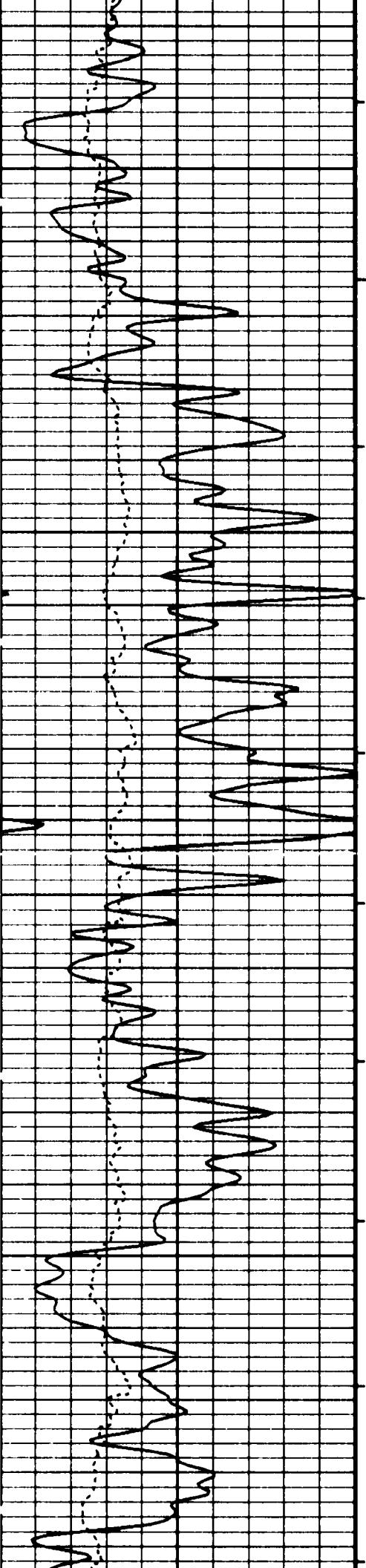
Time Mark Every 60 S

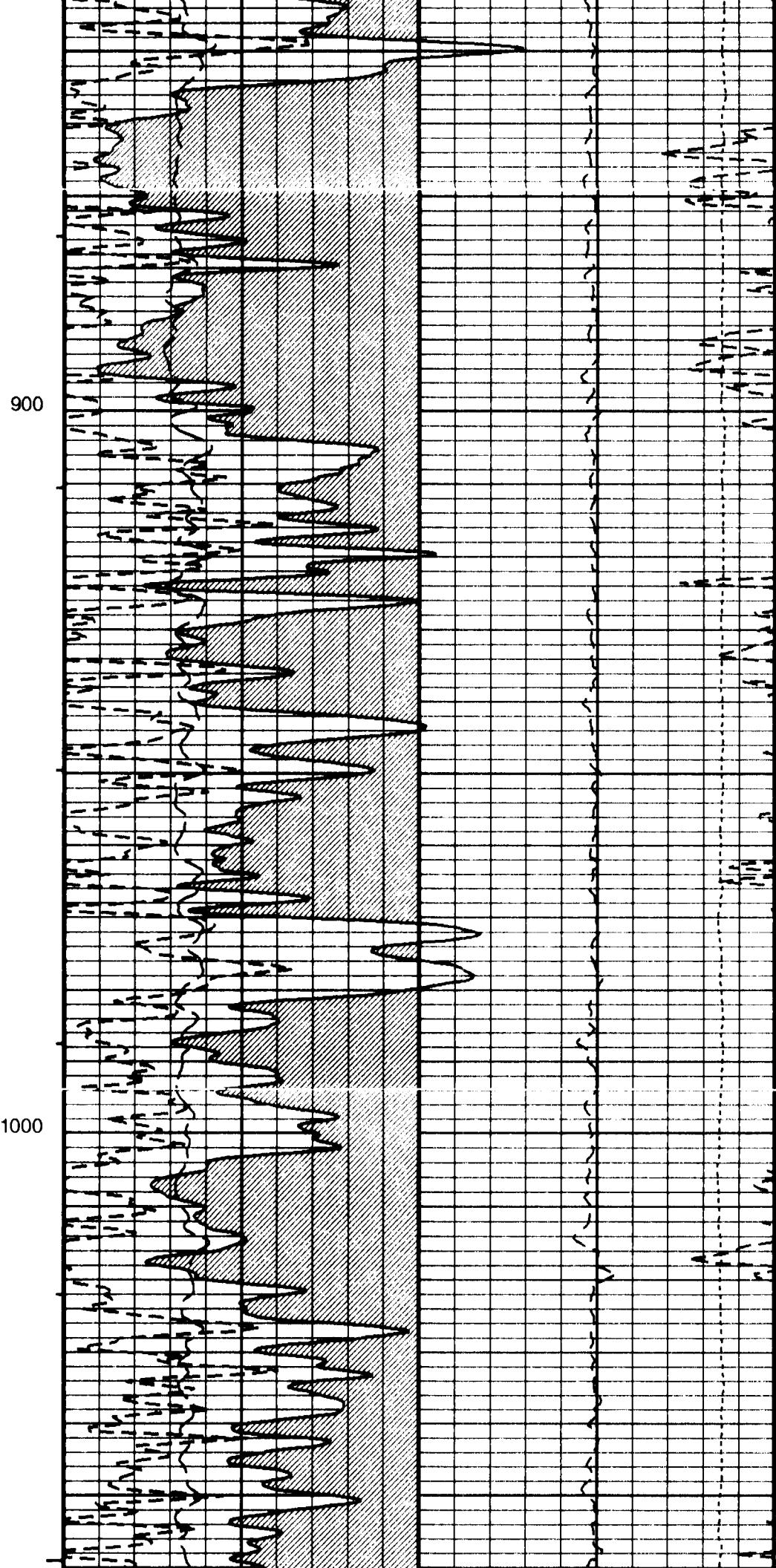
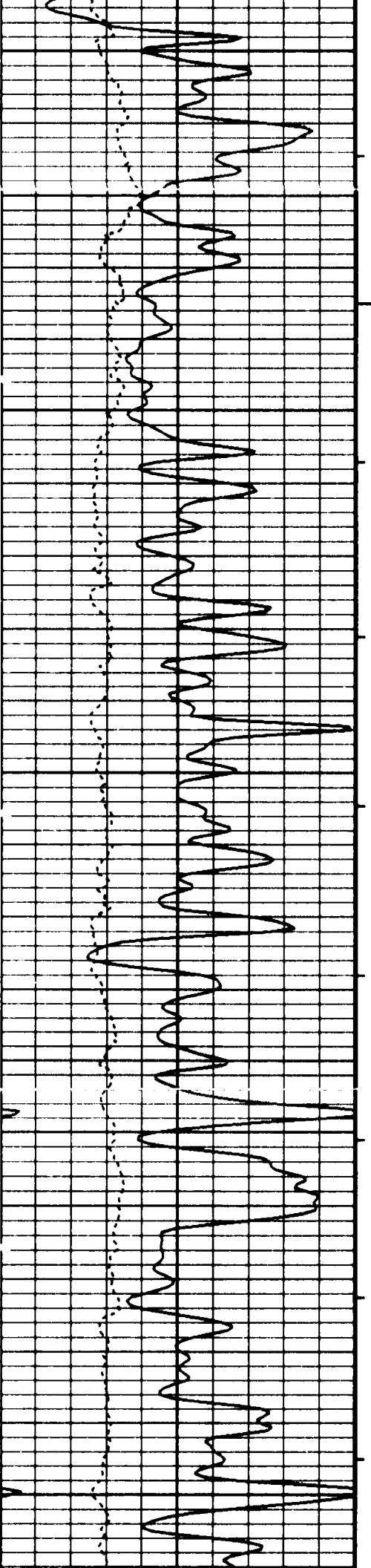
		DPHZ >= 10 p.u. From DPHZ to SpareConstant	Tension (TENS) (LBF)	0
		Std. Res. Density Standoff (DSOZ) (IN)	GAS EFFECT From DPHZ to NPOR	
MAIN PASS	2.5 0.5	Tool/Tot. Drag From D3T to STIA	Std. Res. Formation Pe (PEFZ) (---)	Density Correction (HDRA) (G/C3) 0.25
Caliper (HCAL) (IN)	16	Cable Drag From STIA to STIT	Alpha Processed Neutron Porosity (NPOR) (V/V)	-0.1
Gamma Ray (GR) (GAPI)	200	Stuck Stretch (STIT)	Std. Res. Density Porosity (DPHZ) (V/V)	-0.1
	0 (F) 50			

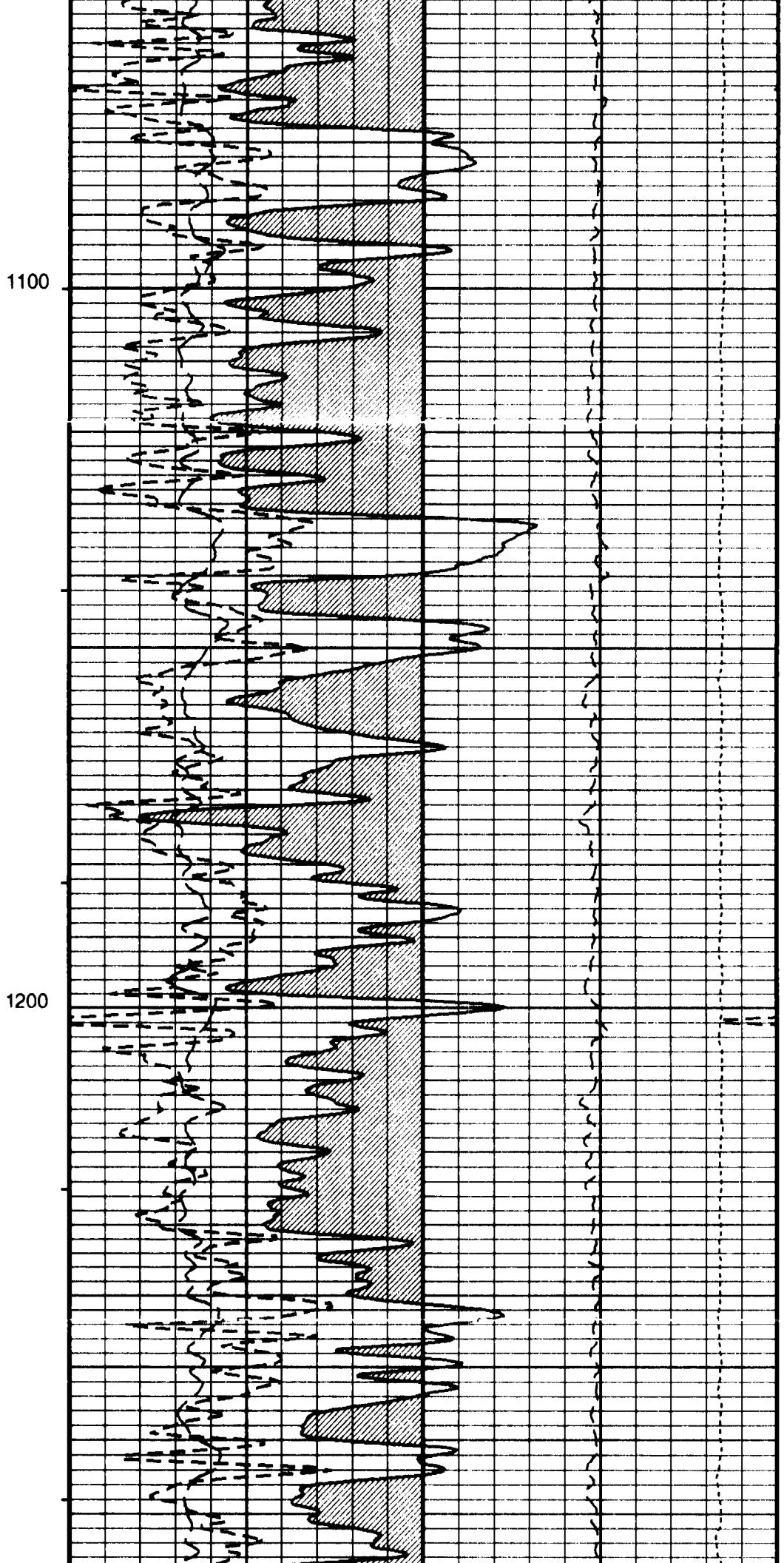
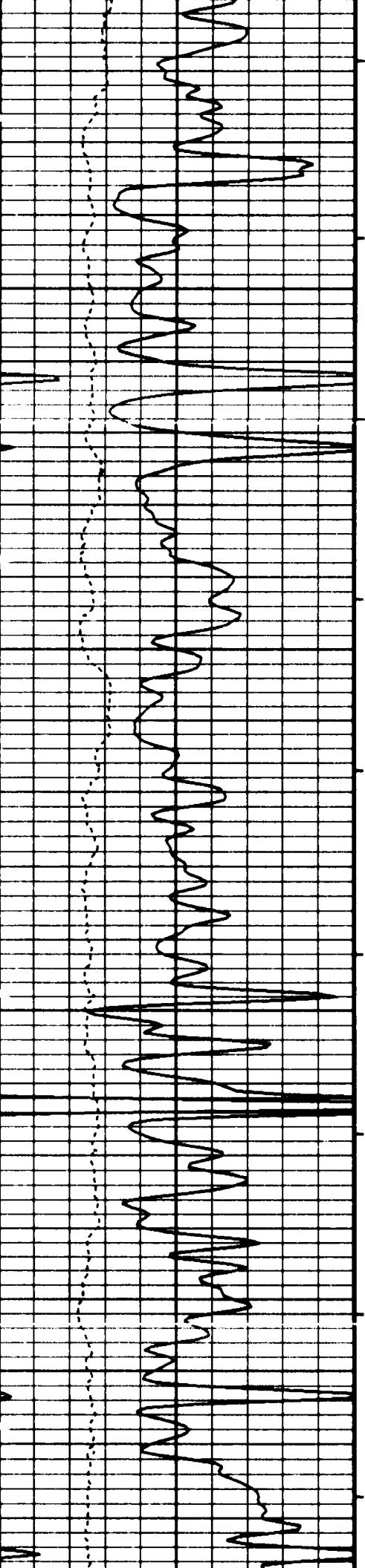




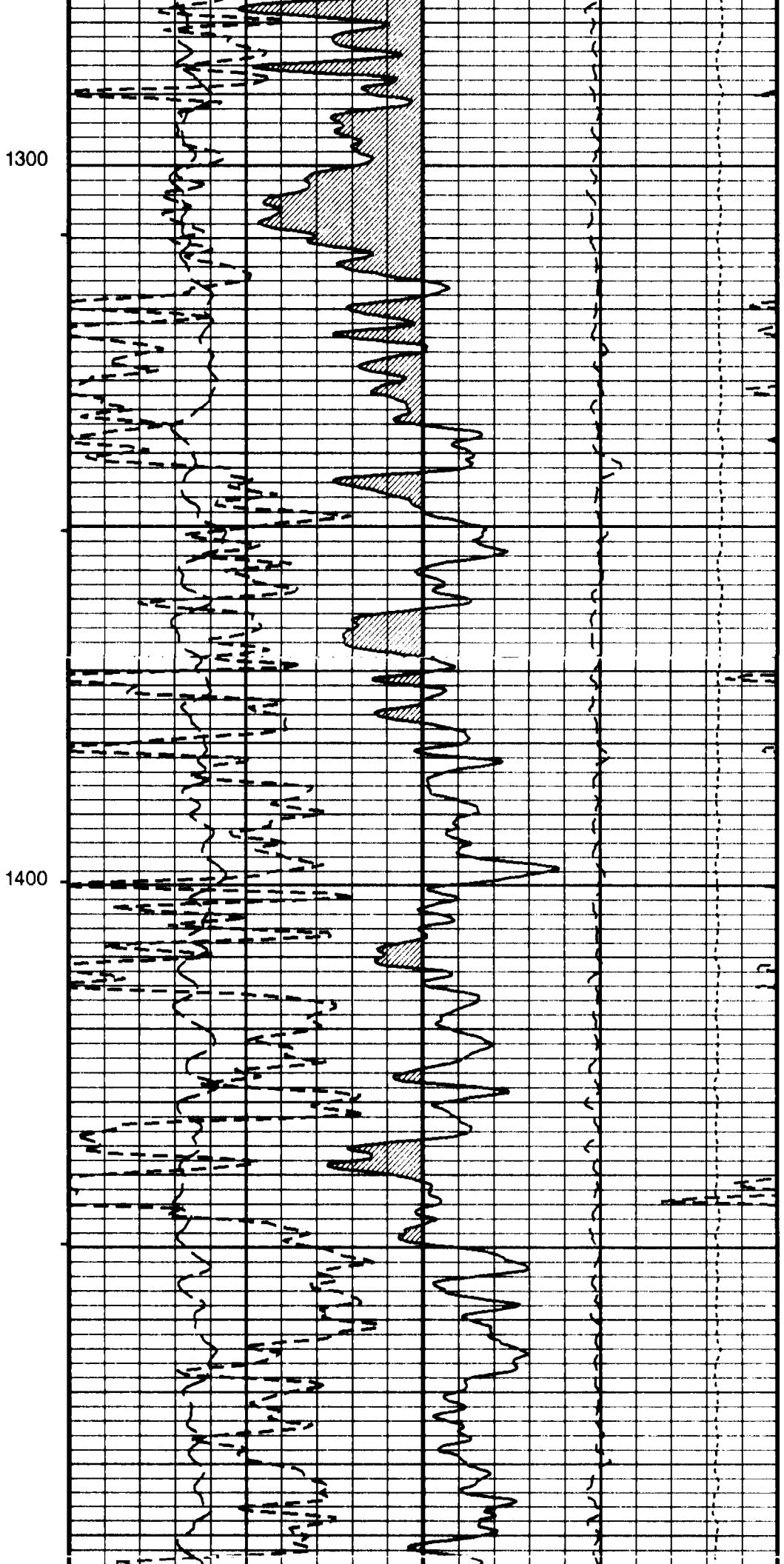
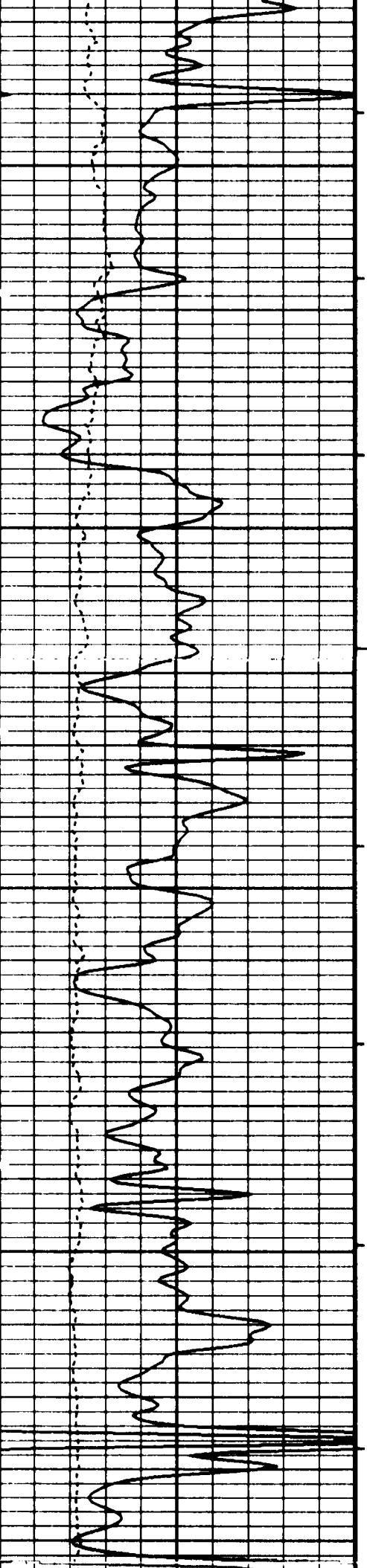


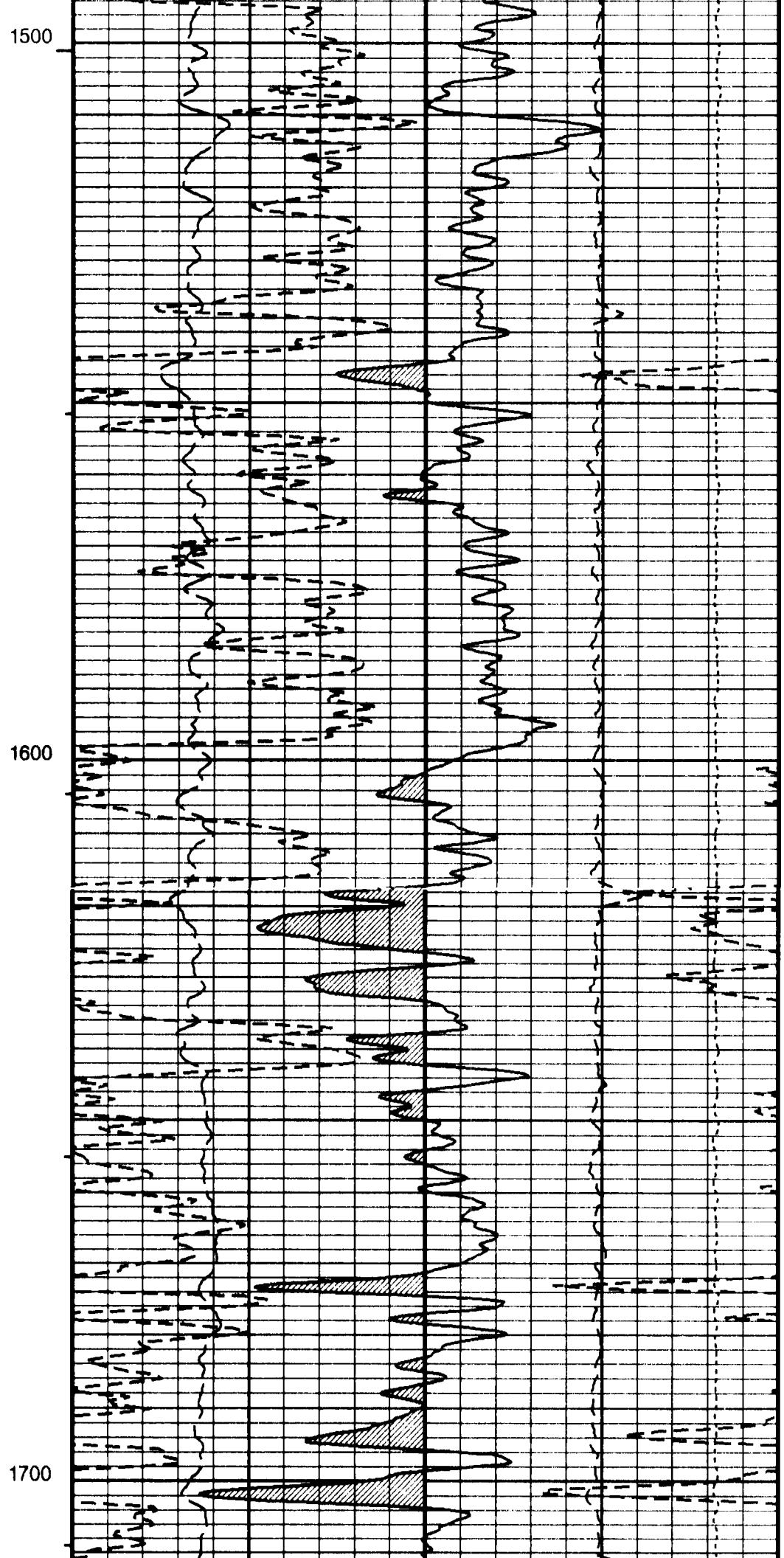
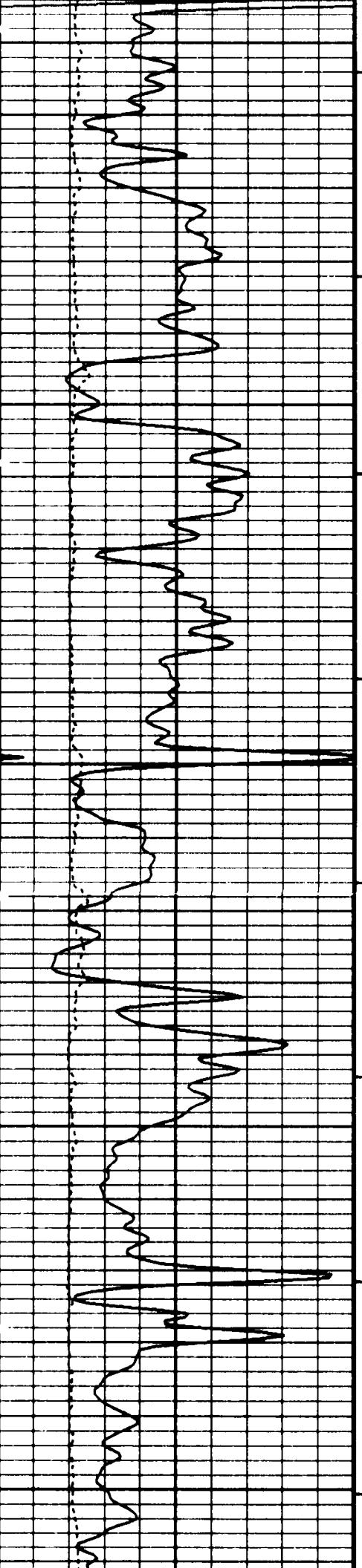


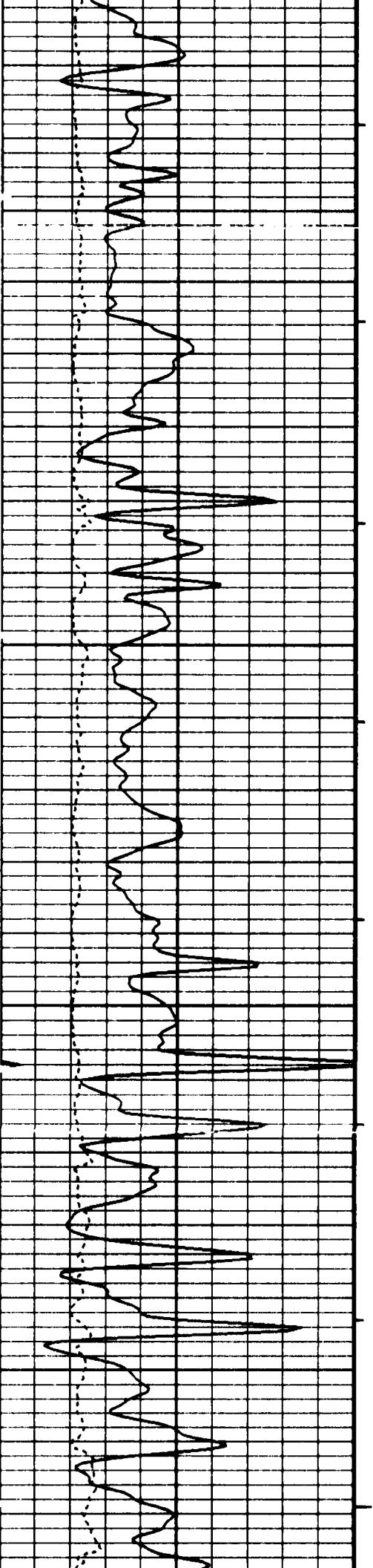




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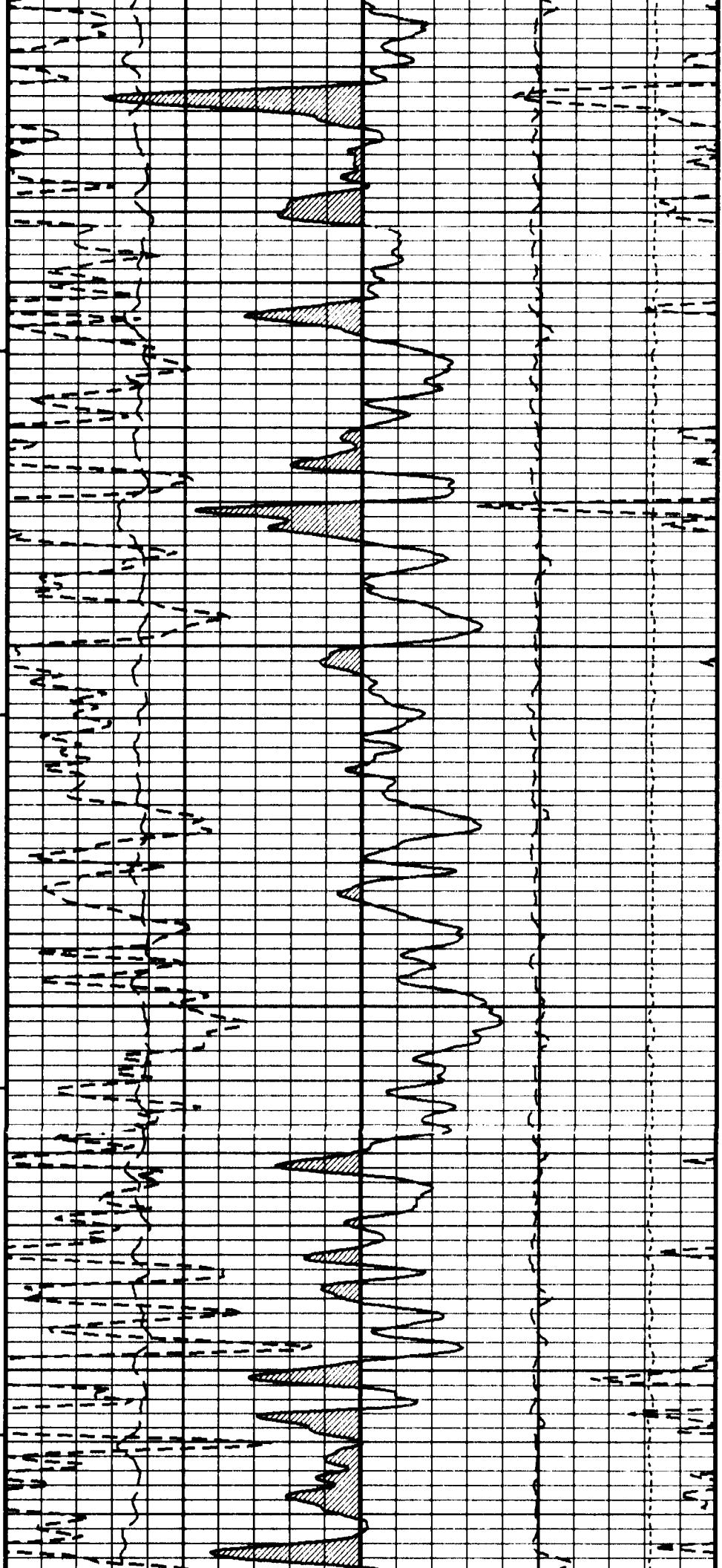


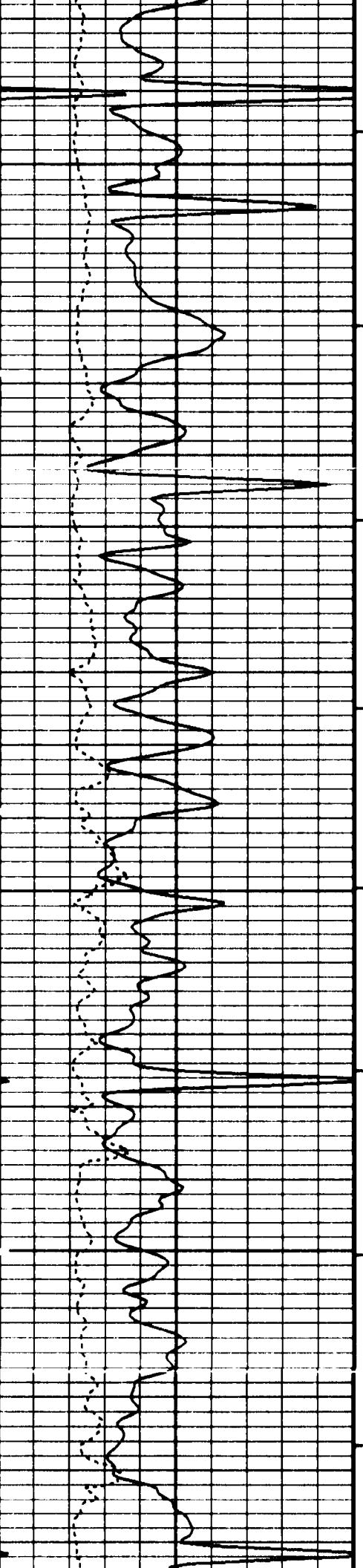




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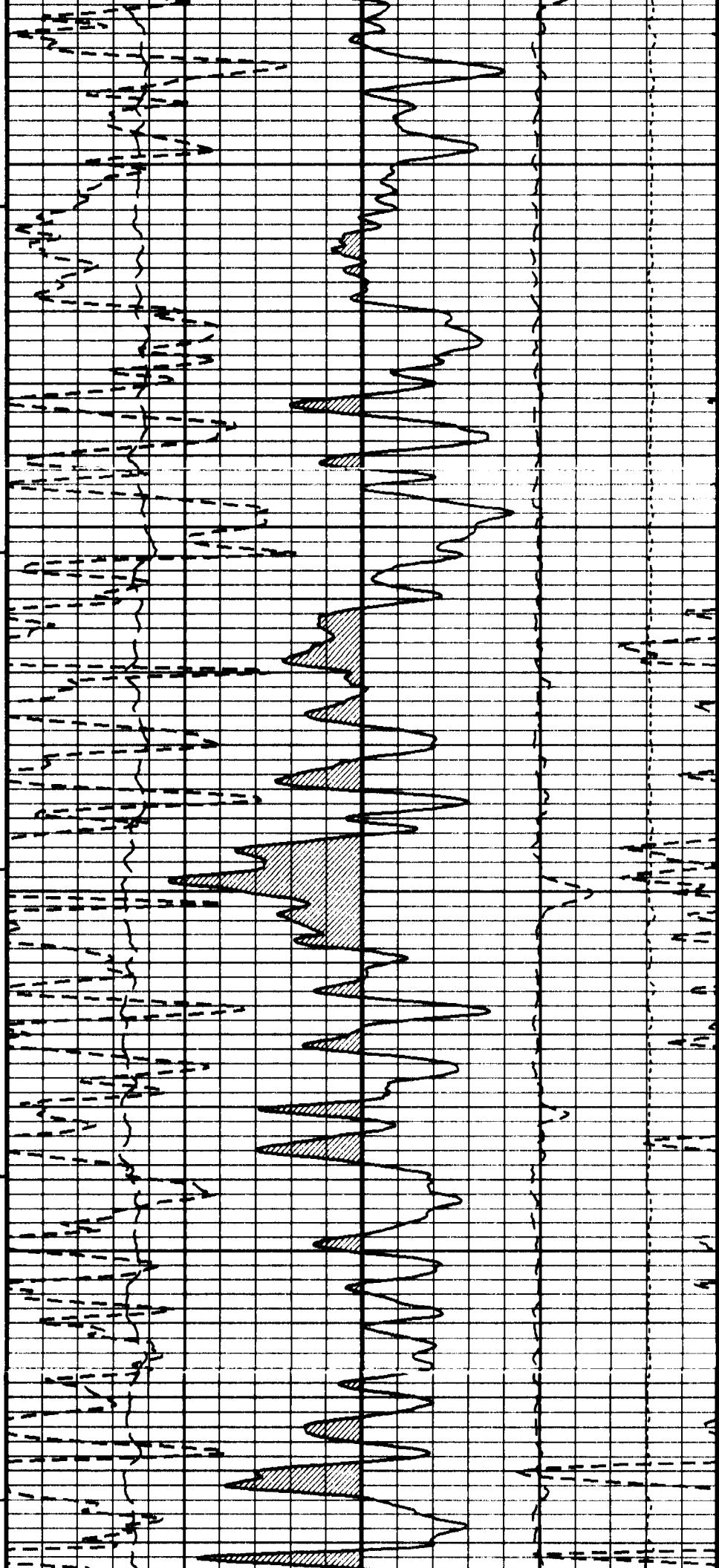
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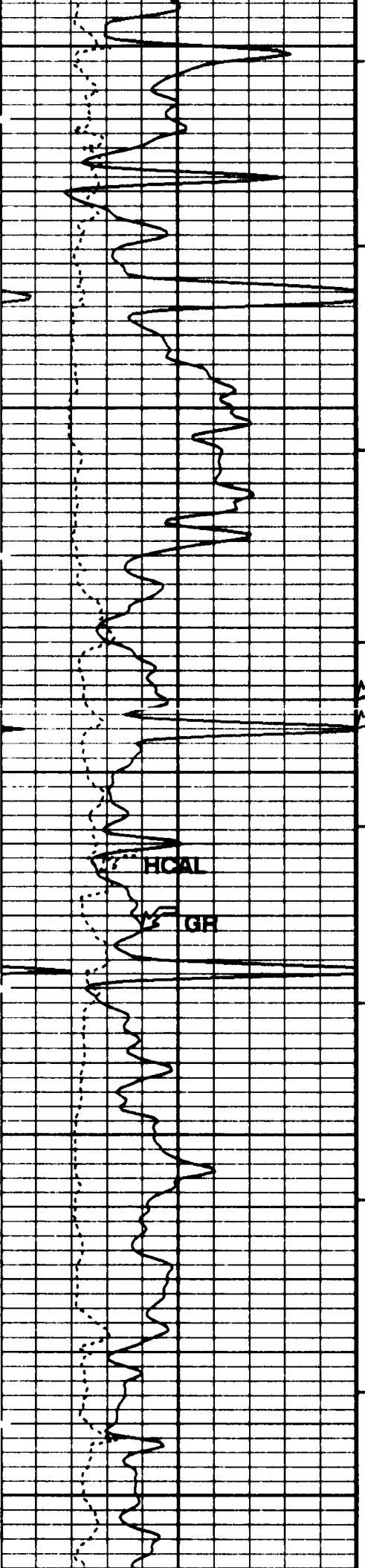




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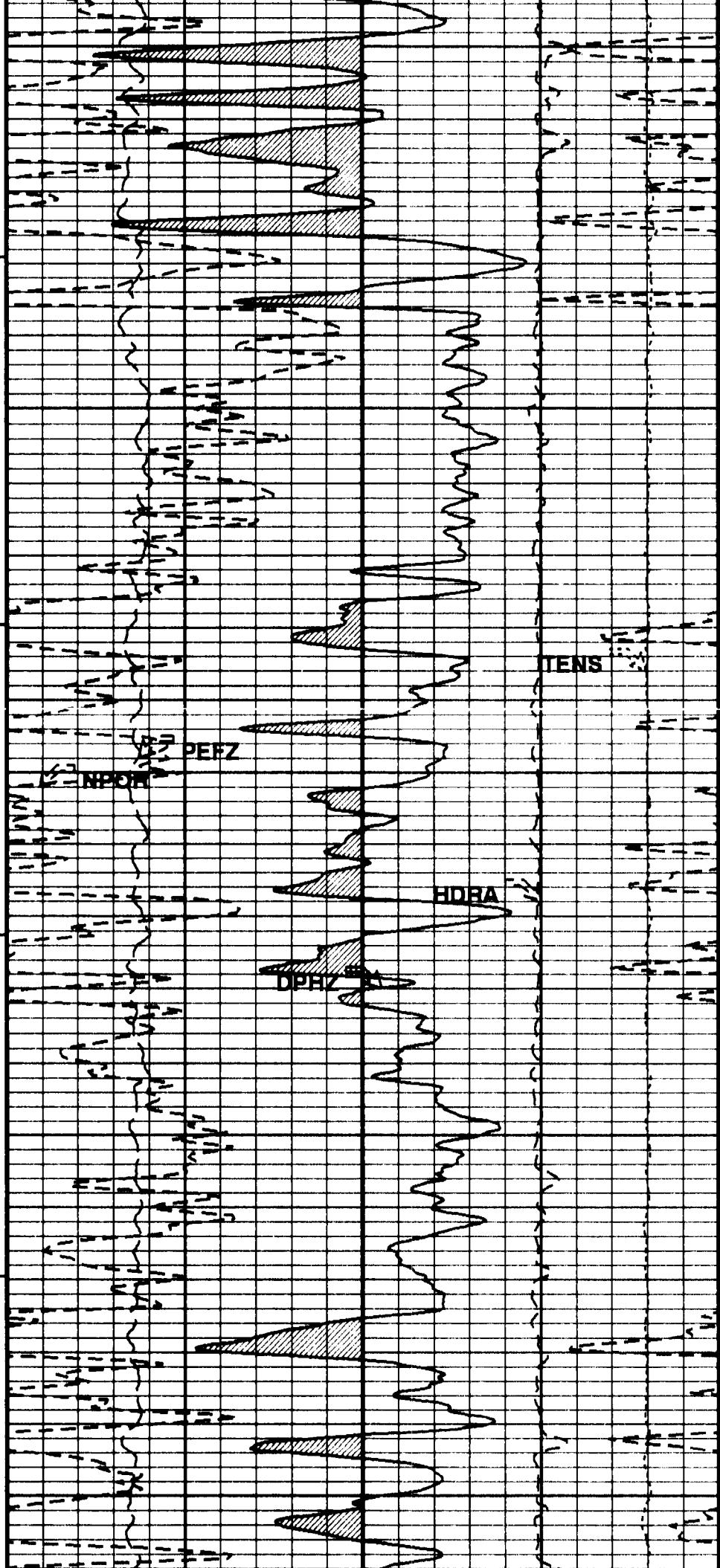
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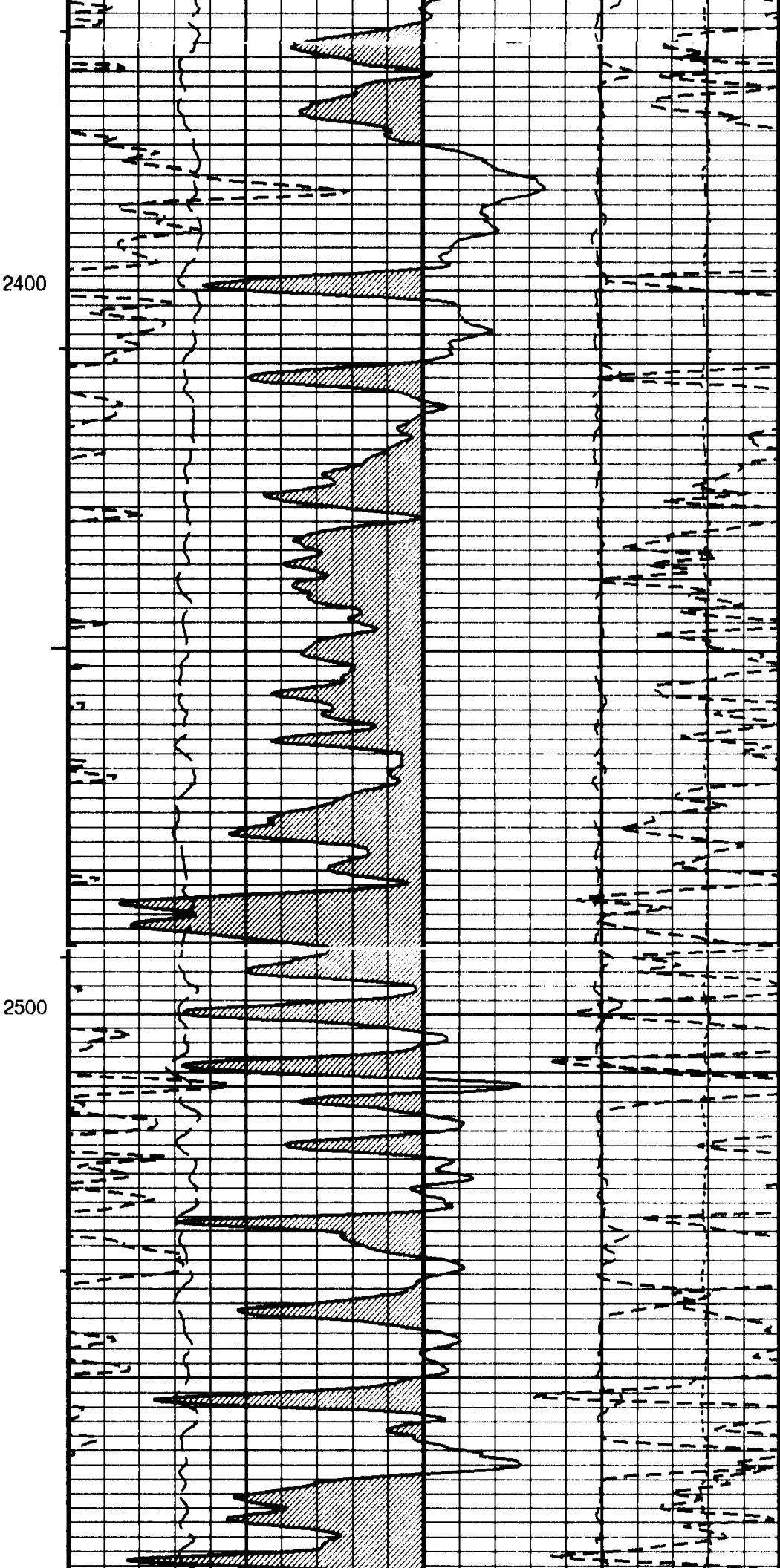
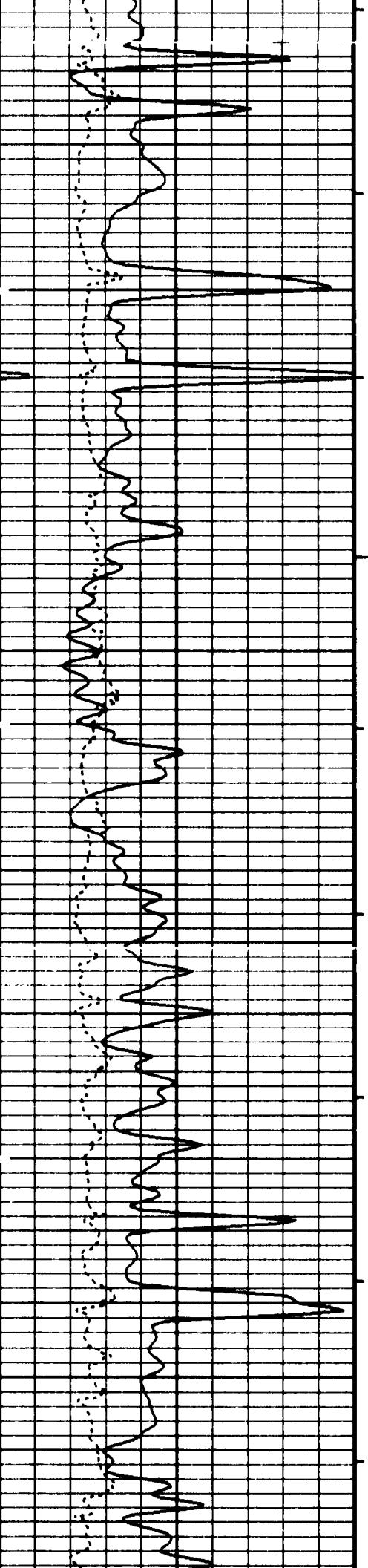




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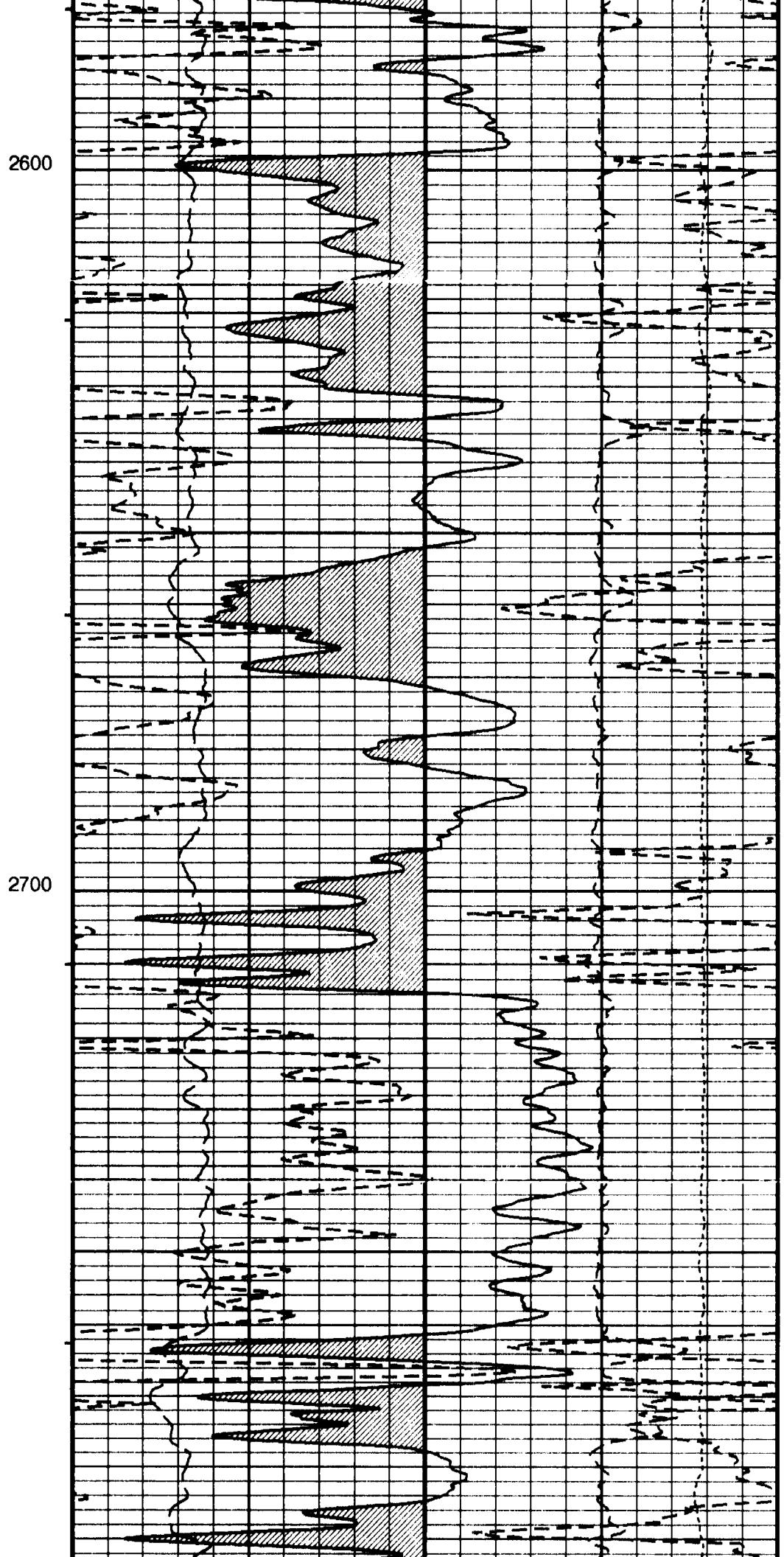
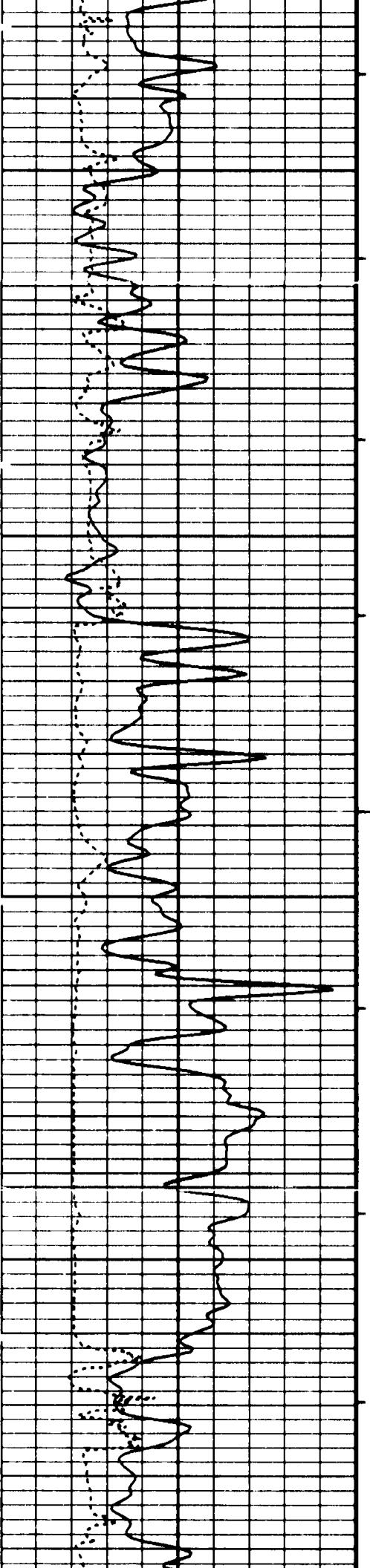
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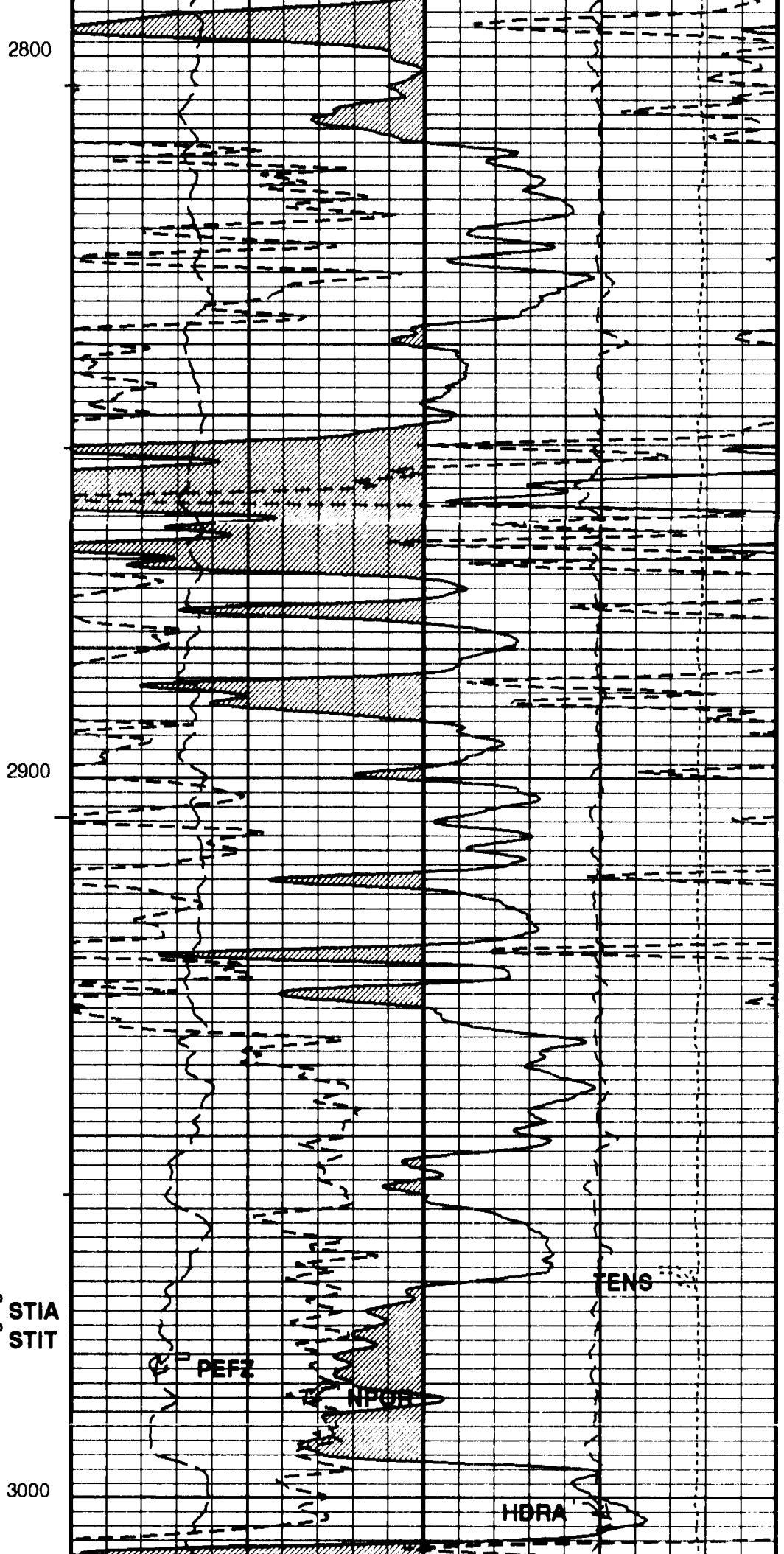
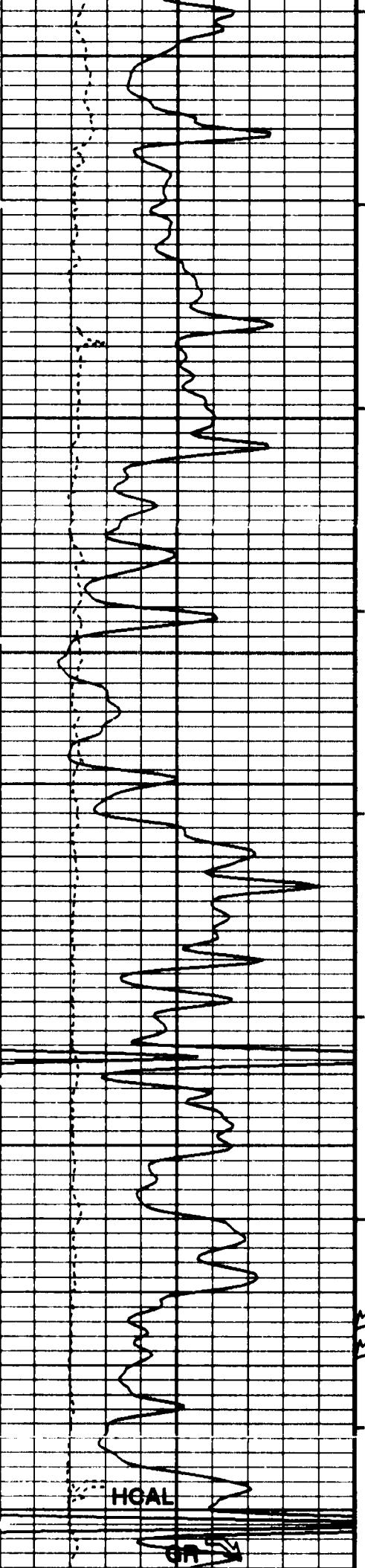


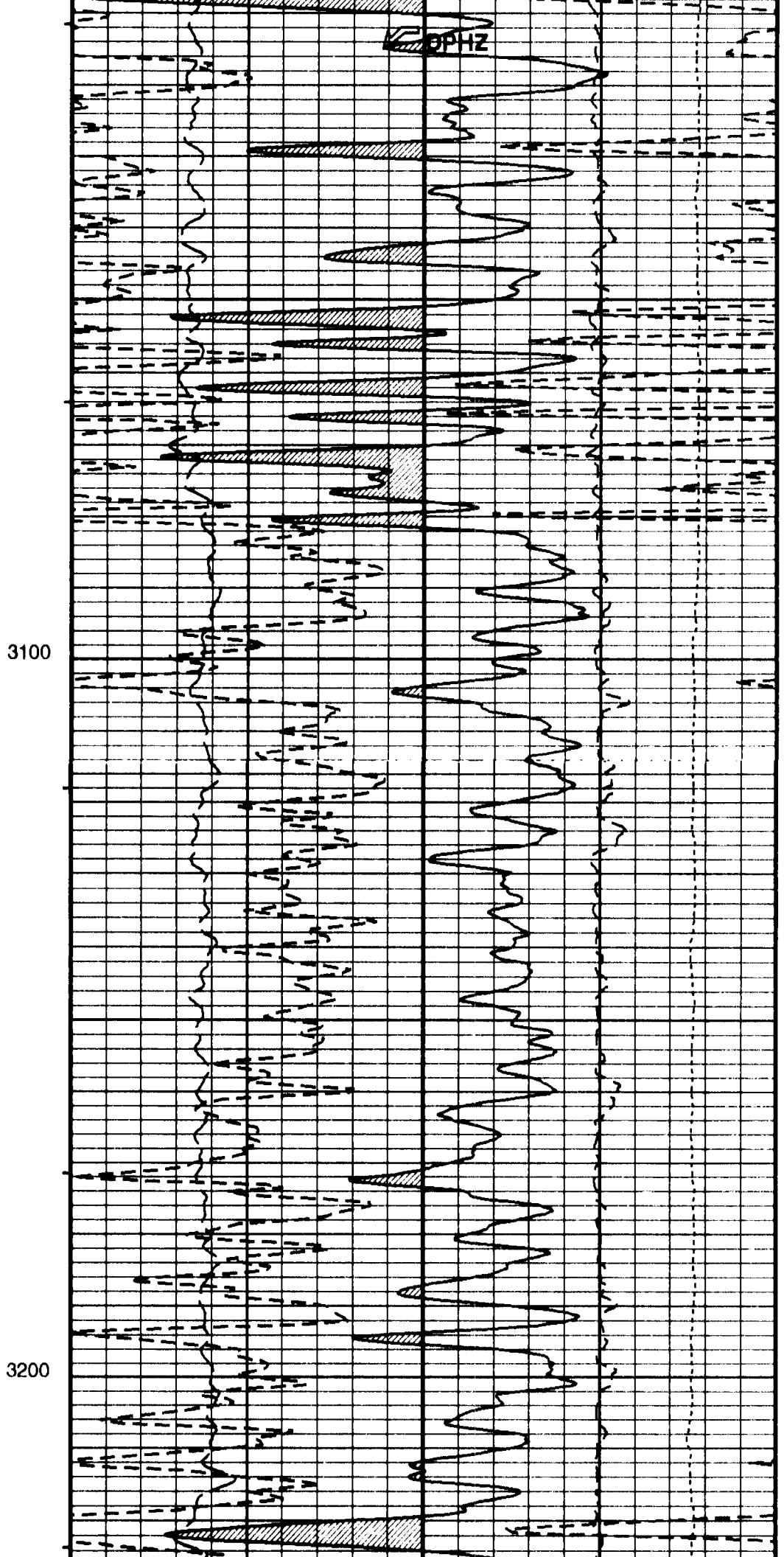
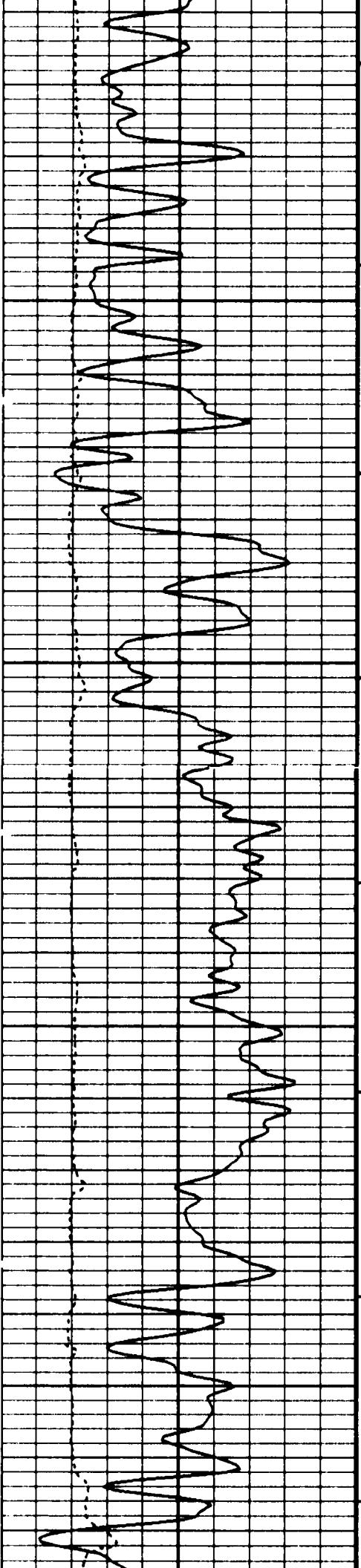


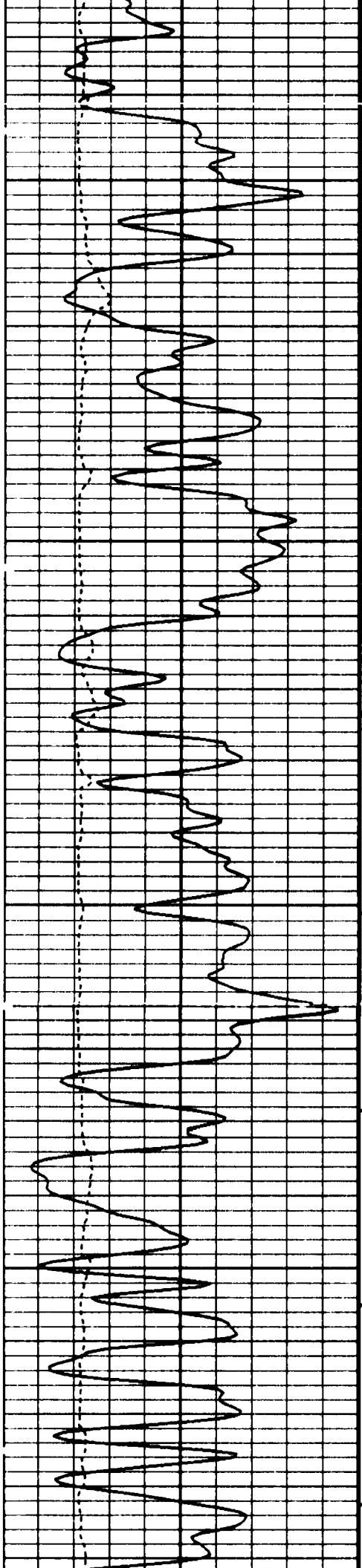
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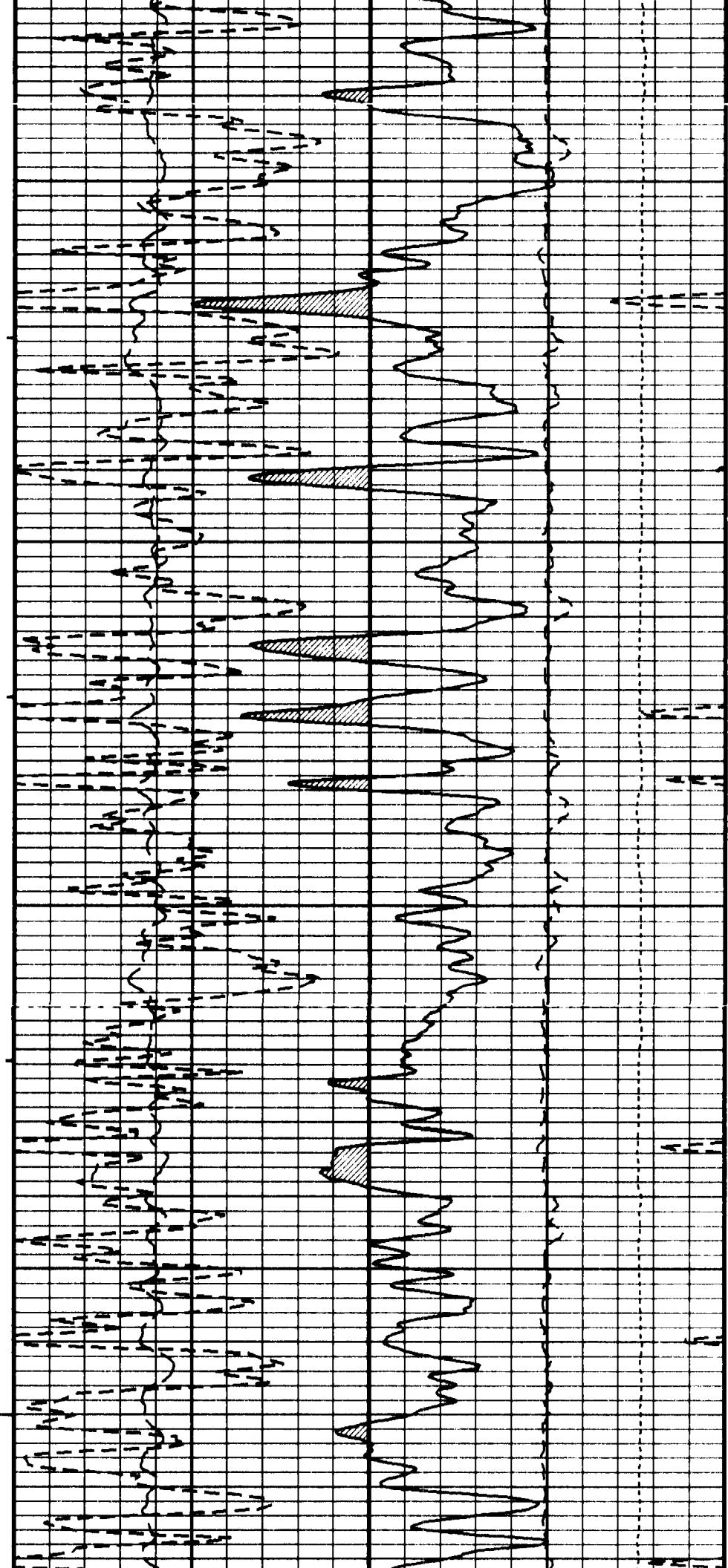


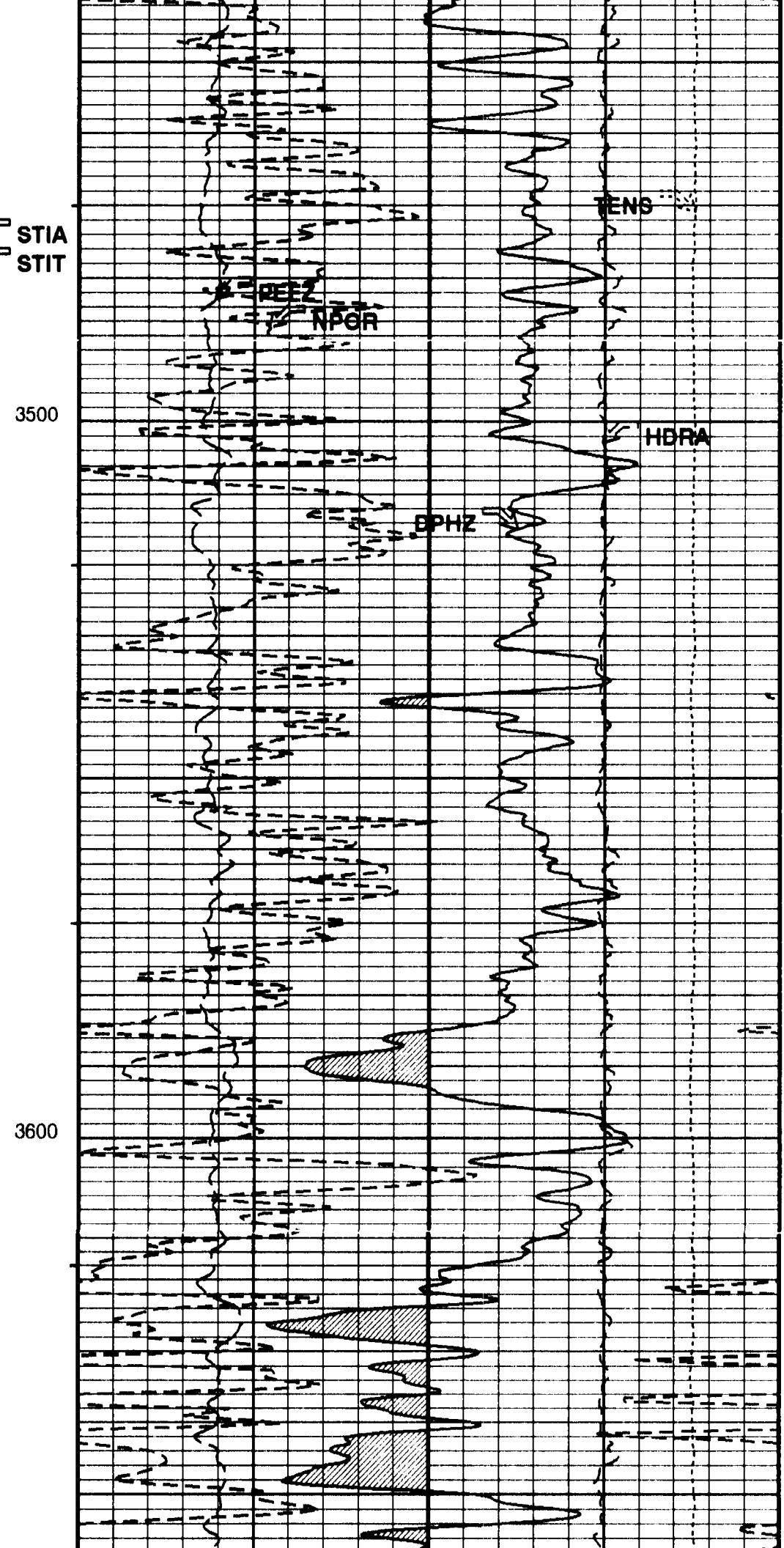
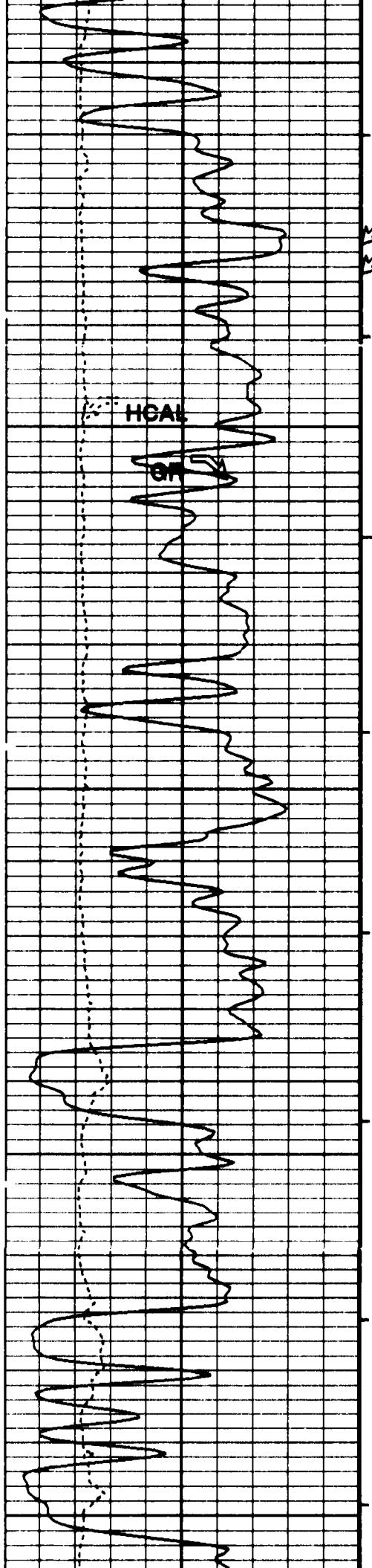


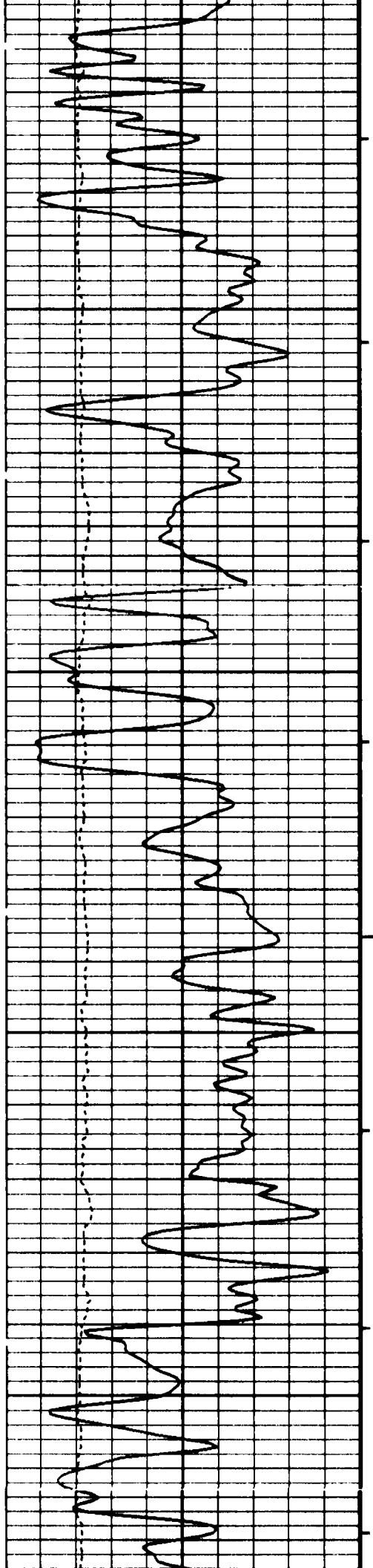


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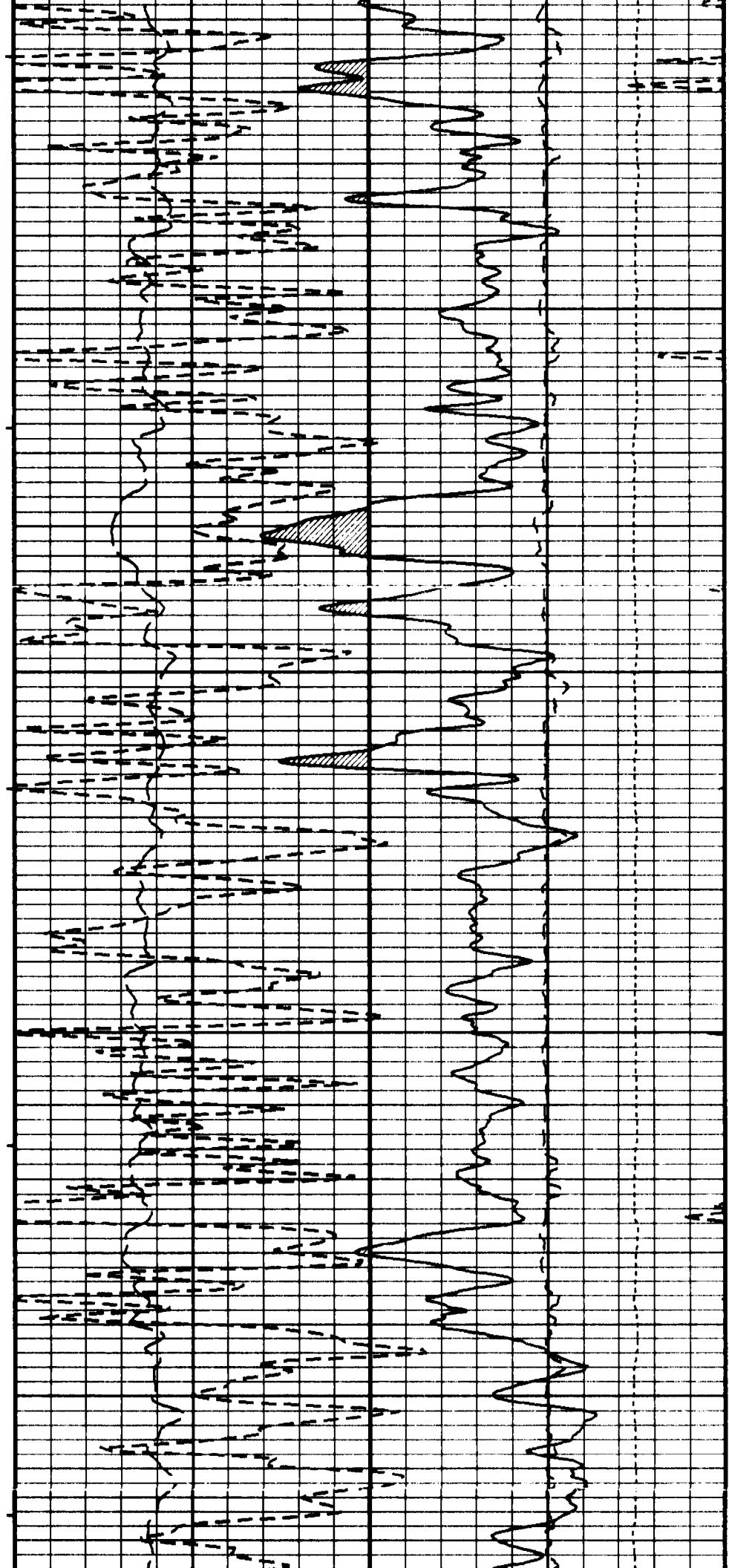


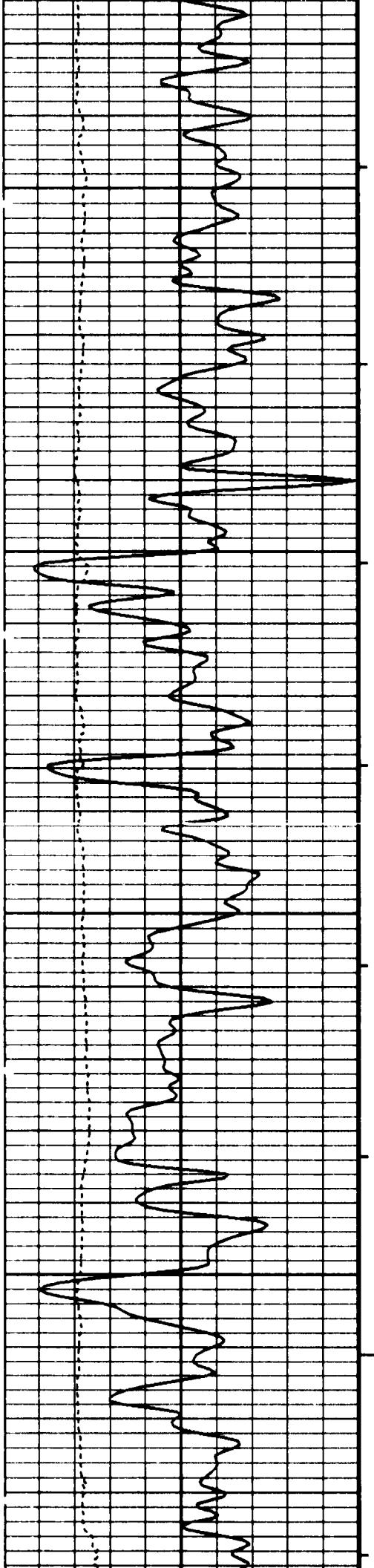




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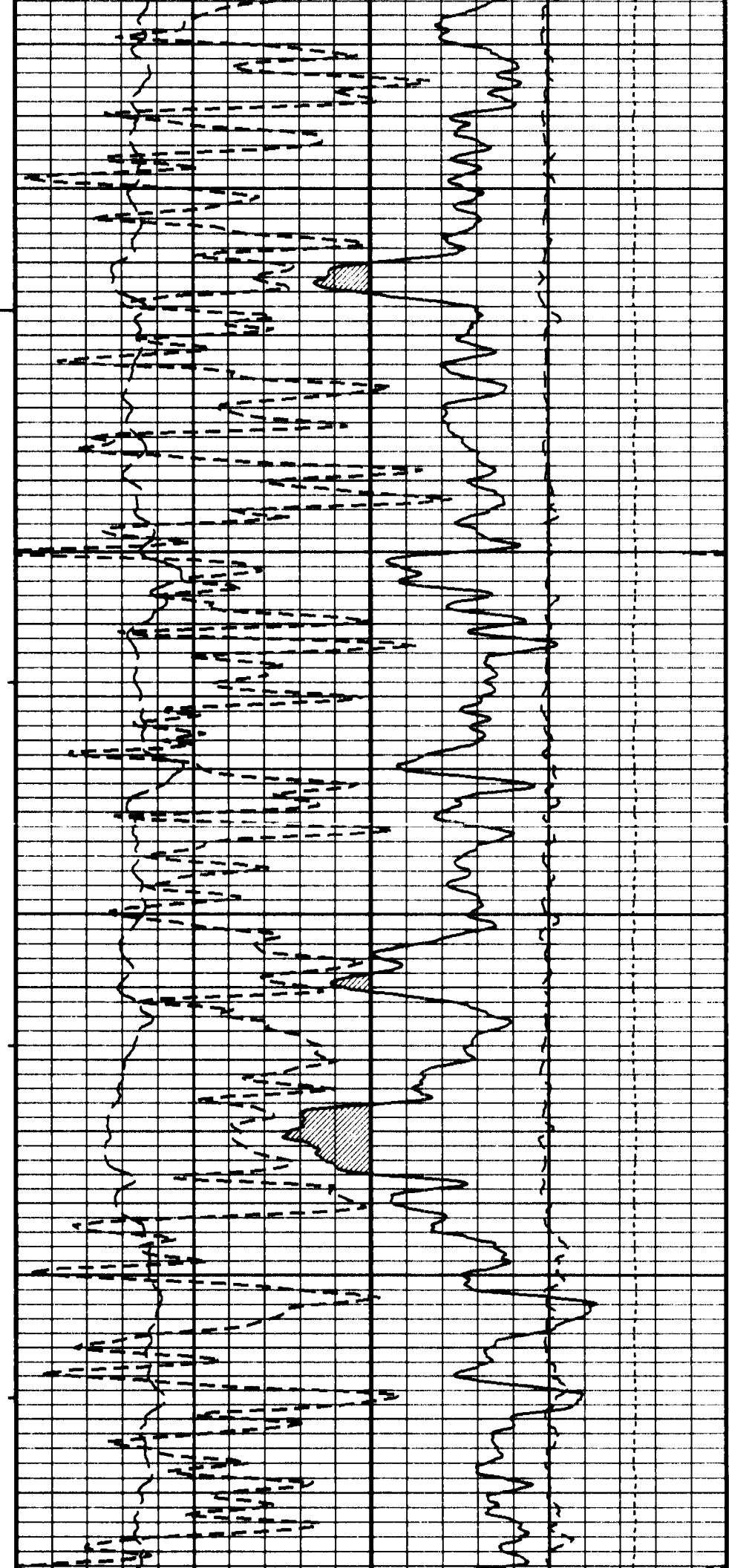
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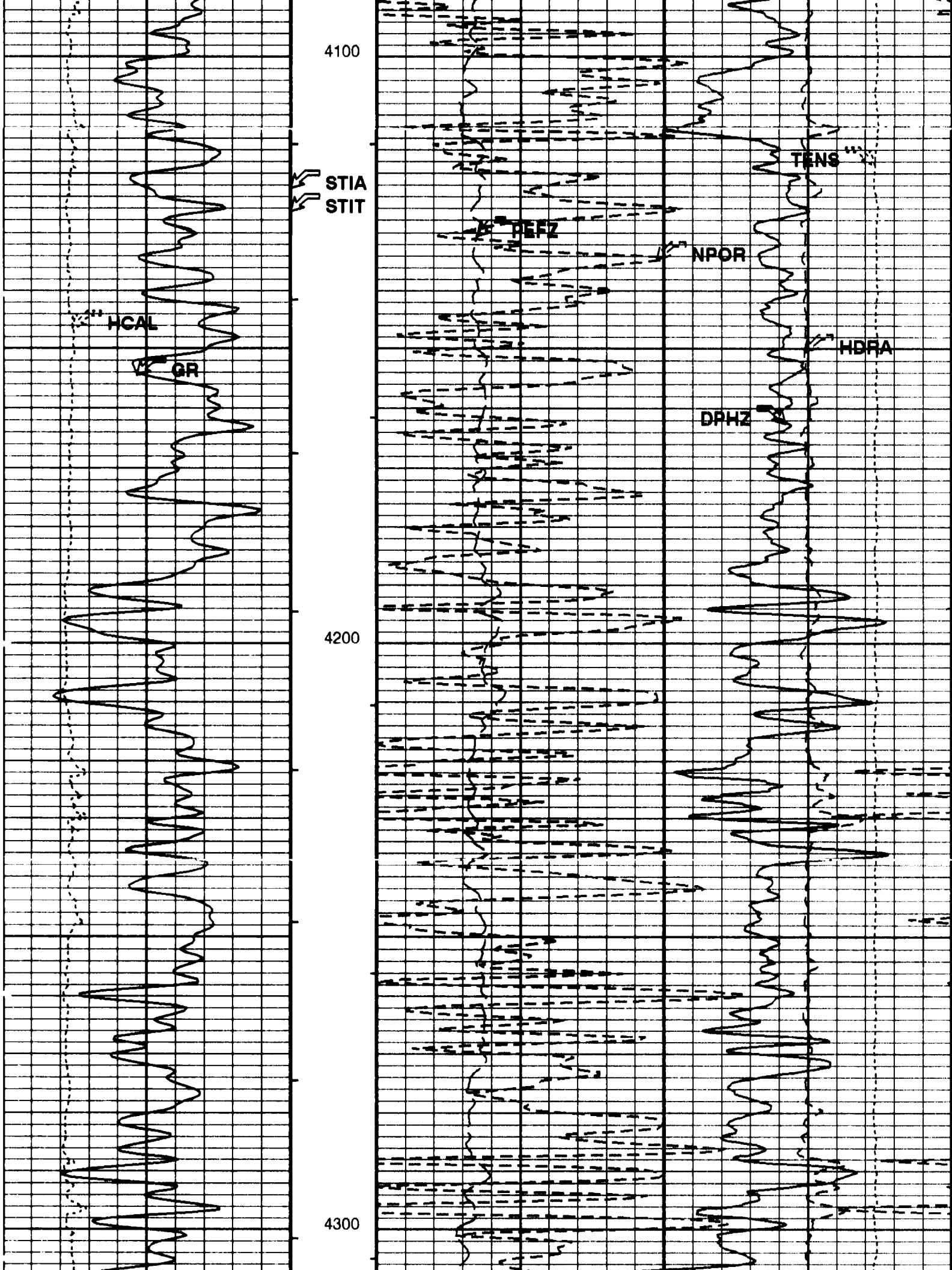


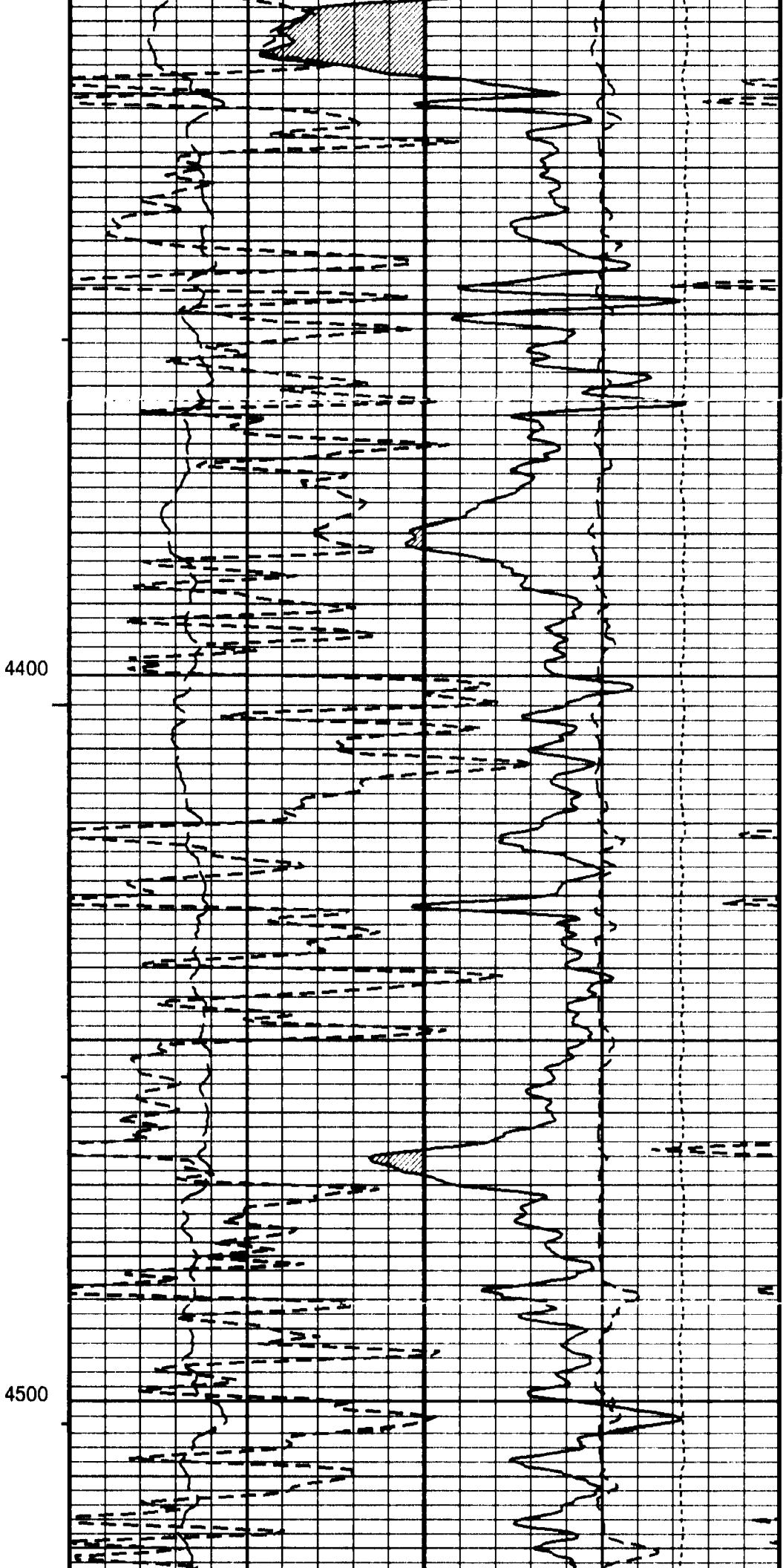
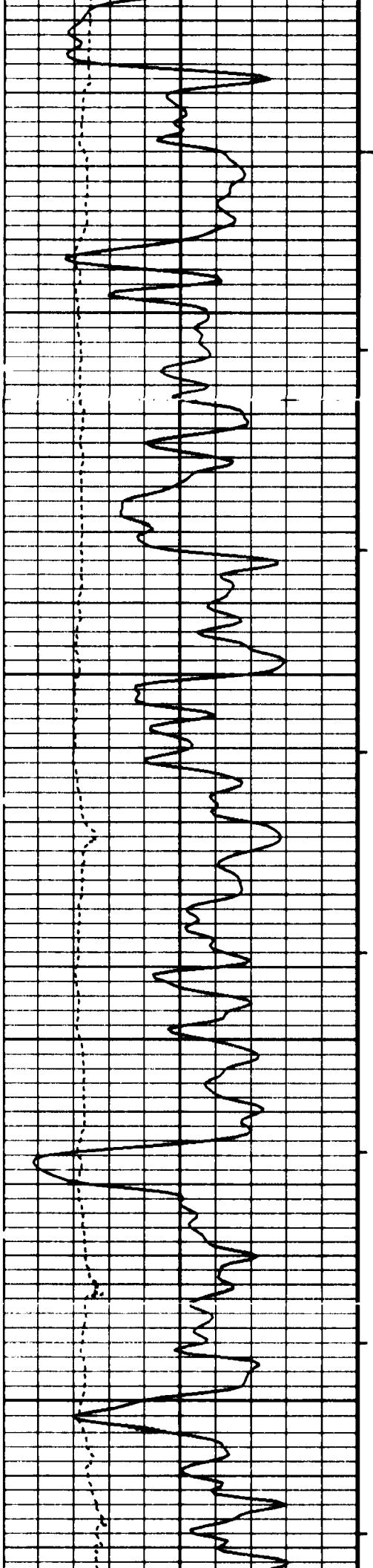


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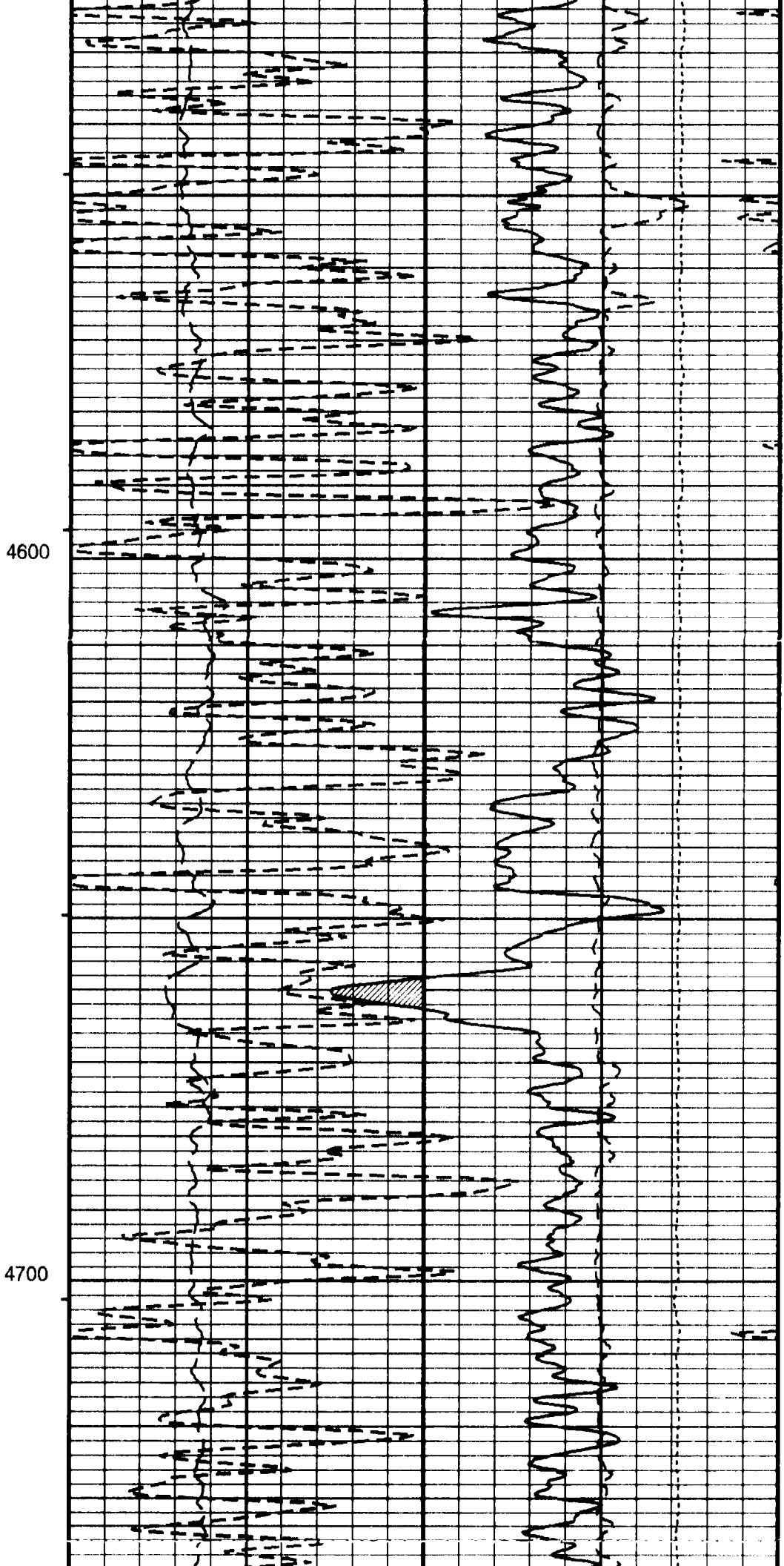
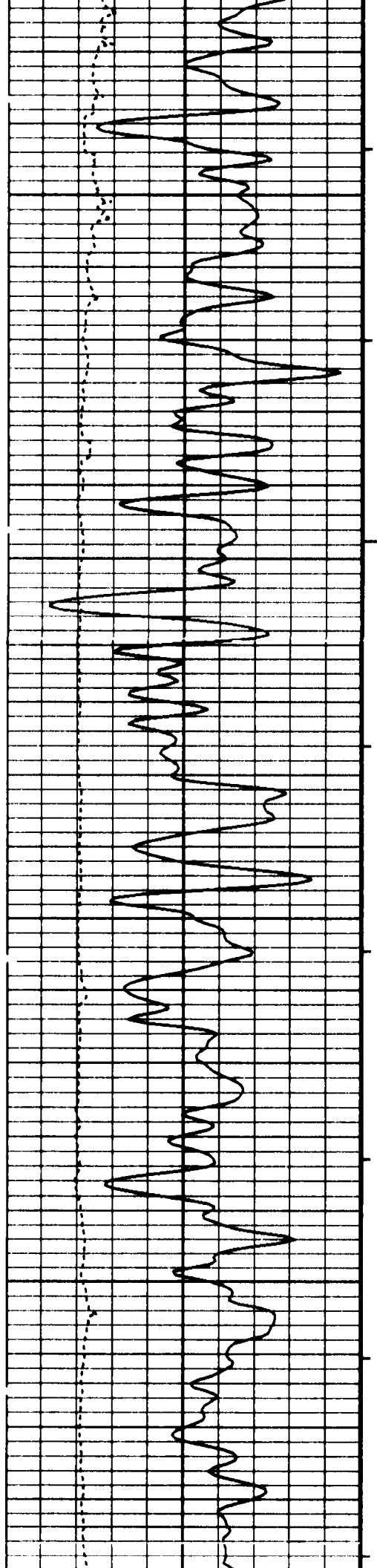
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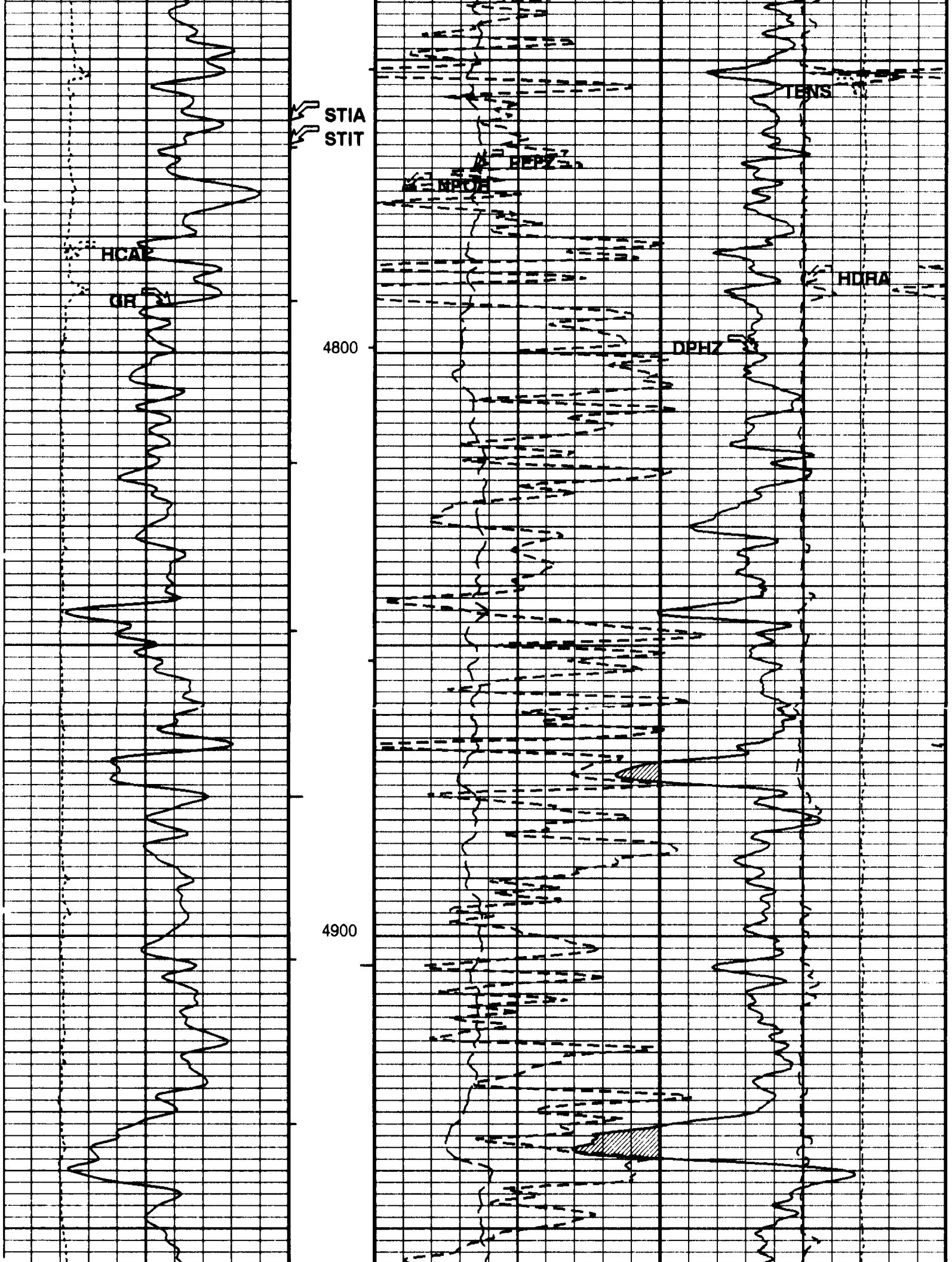


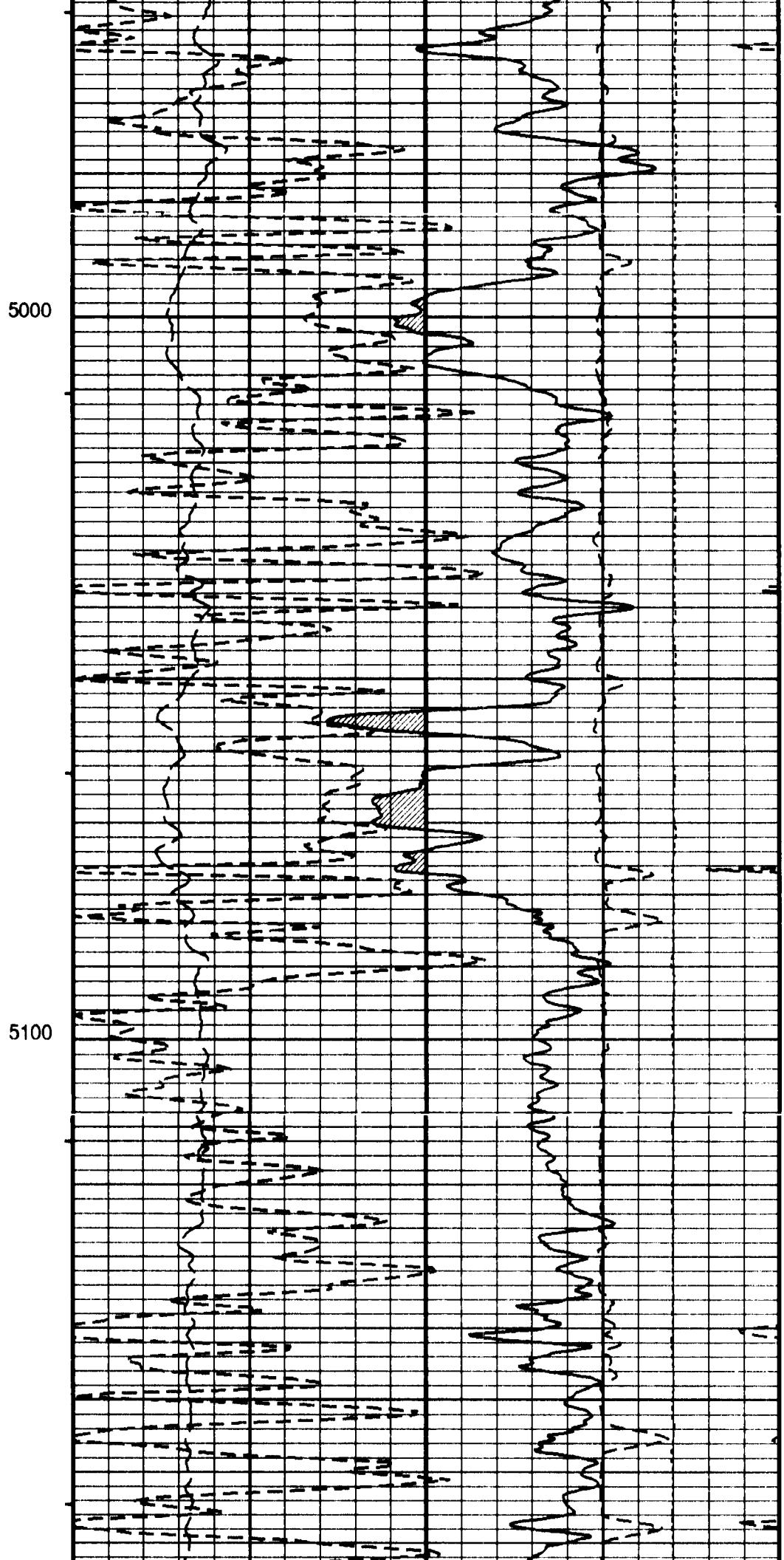
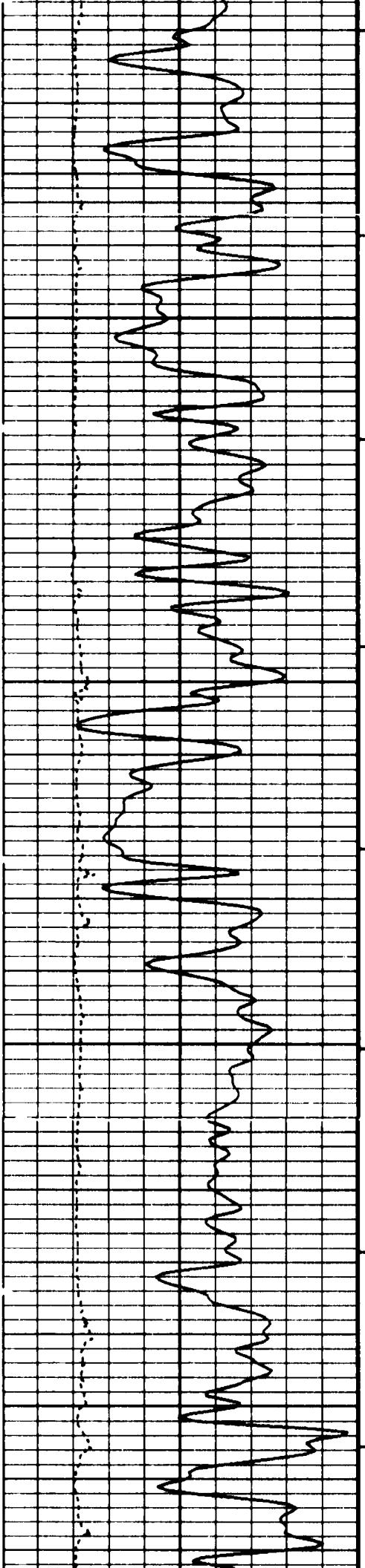


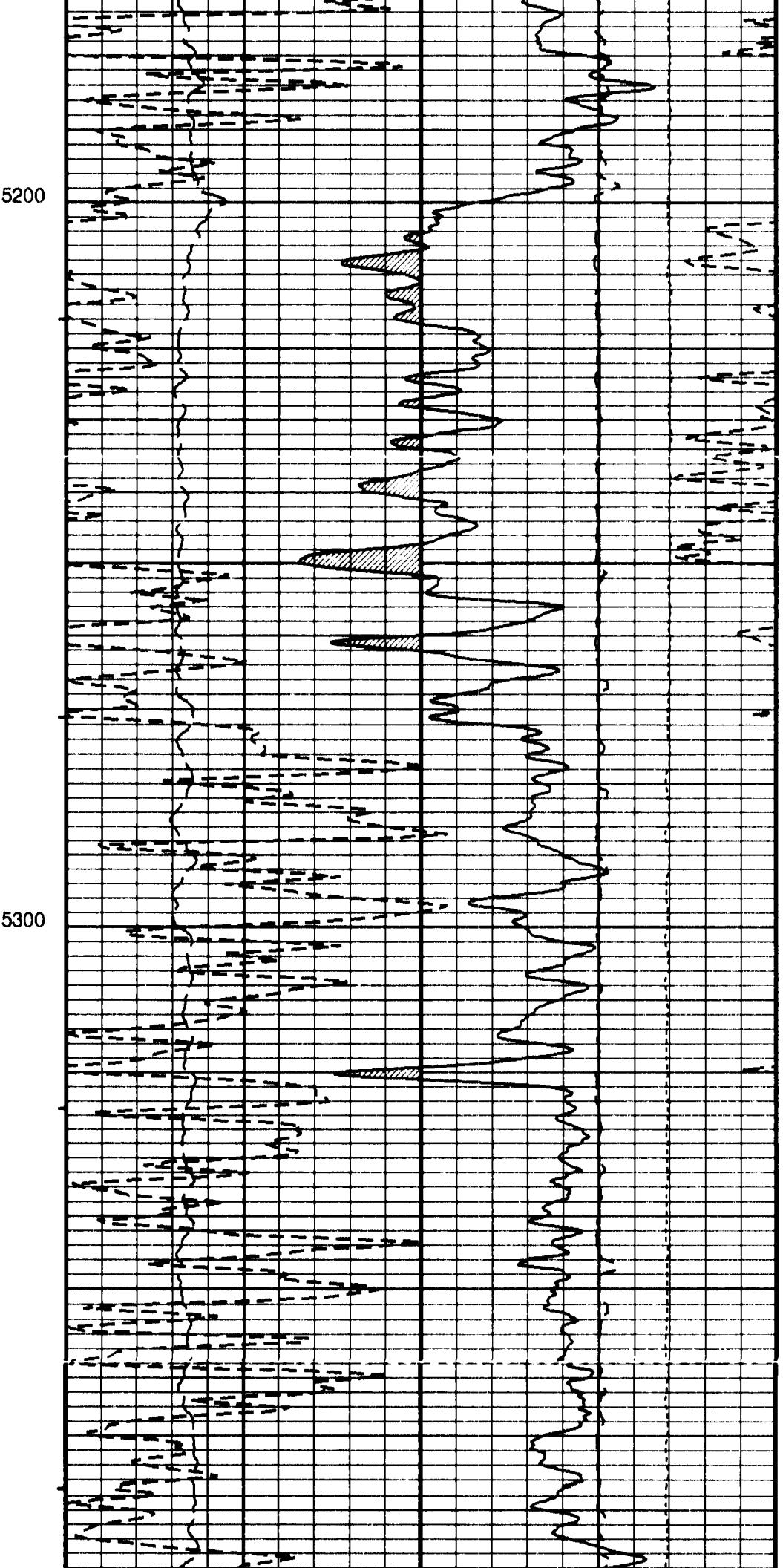
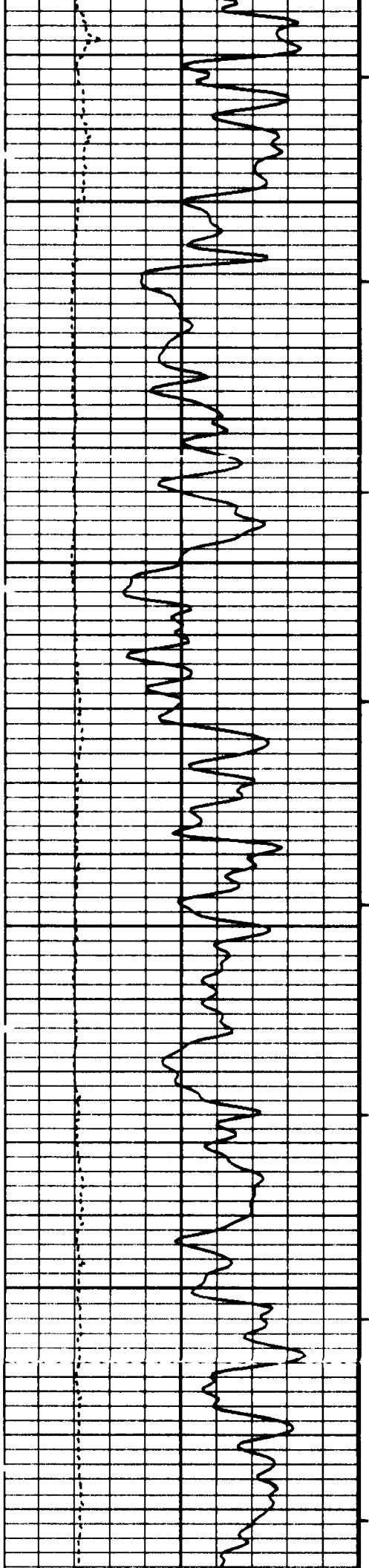


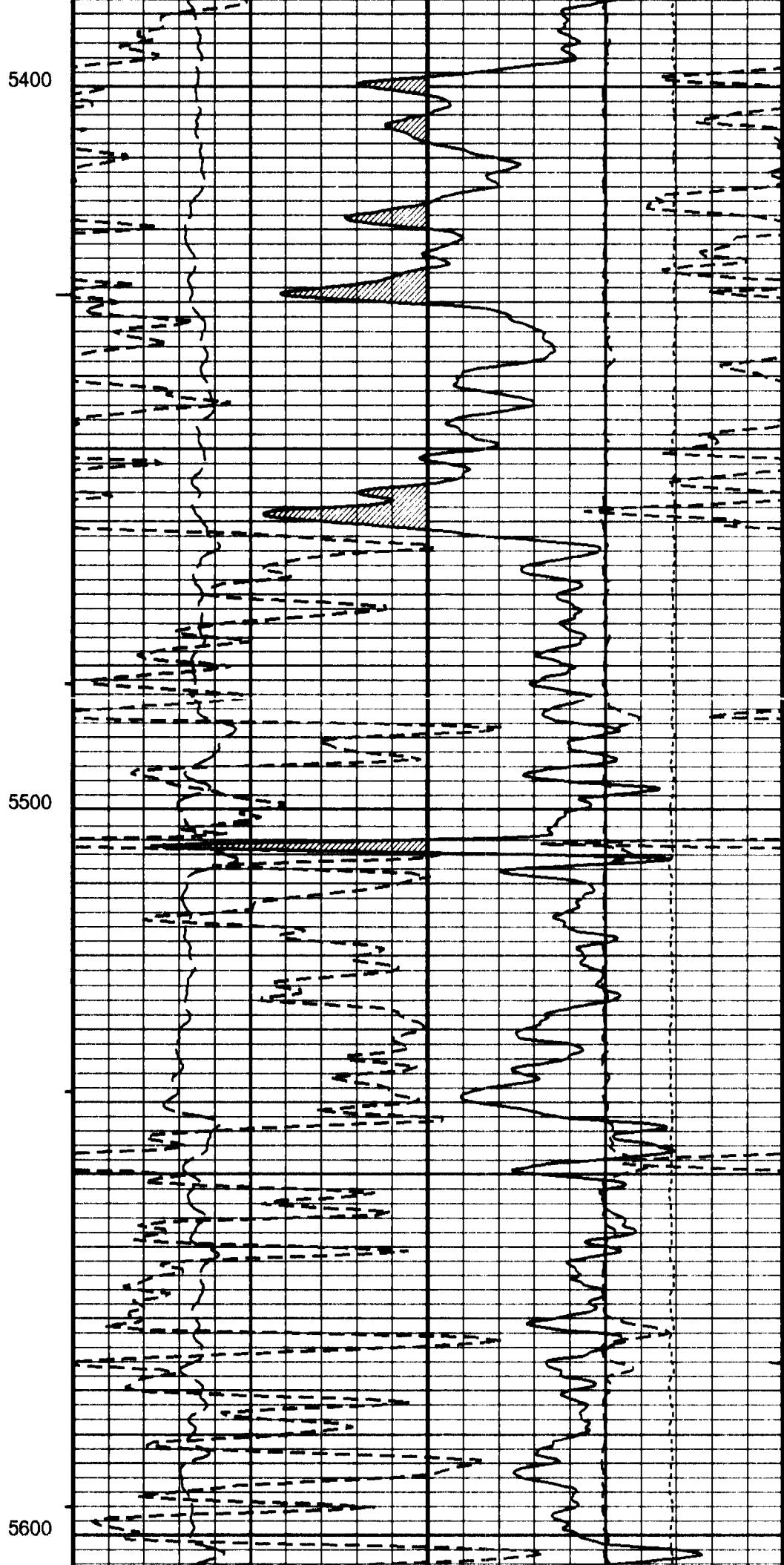
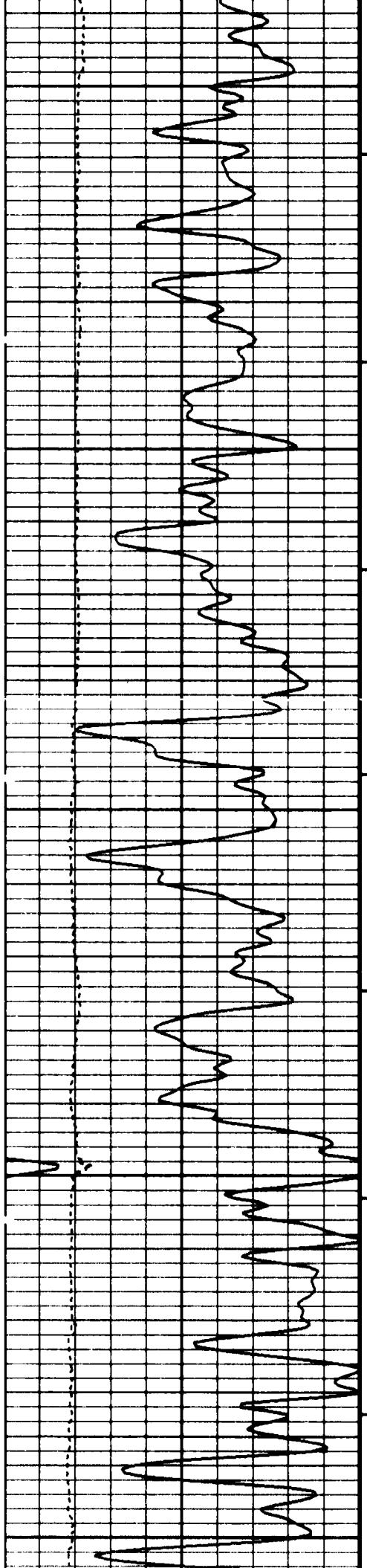
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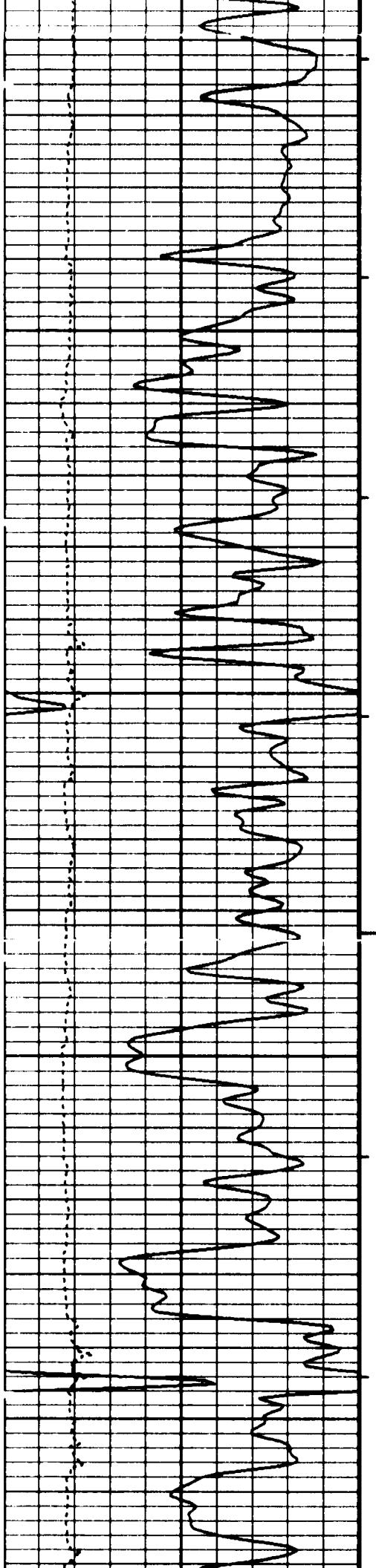






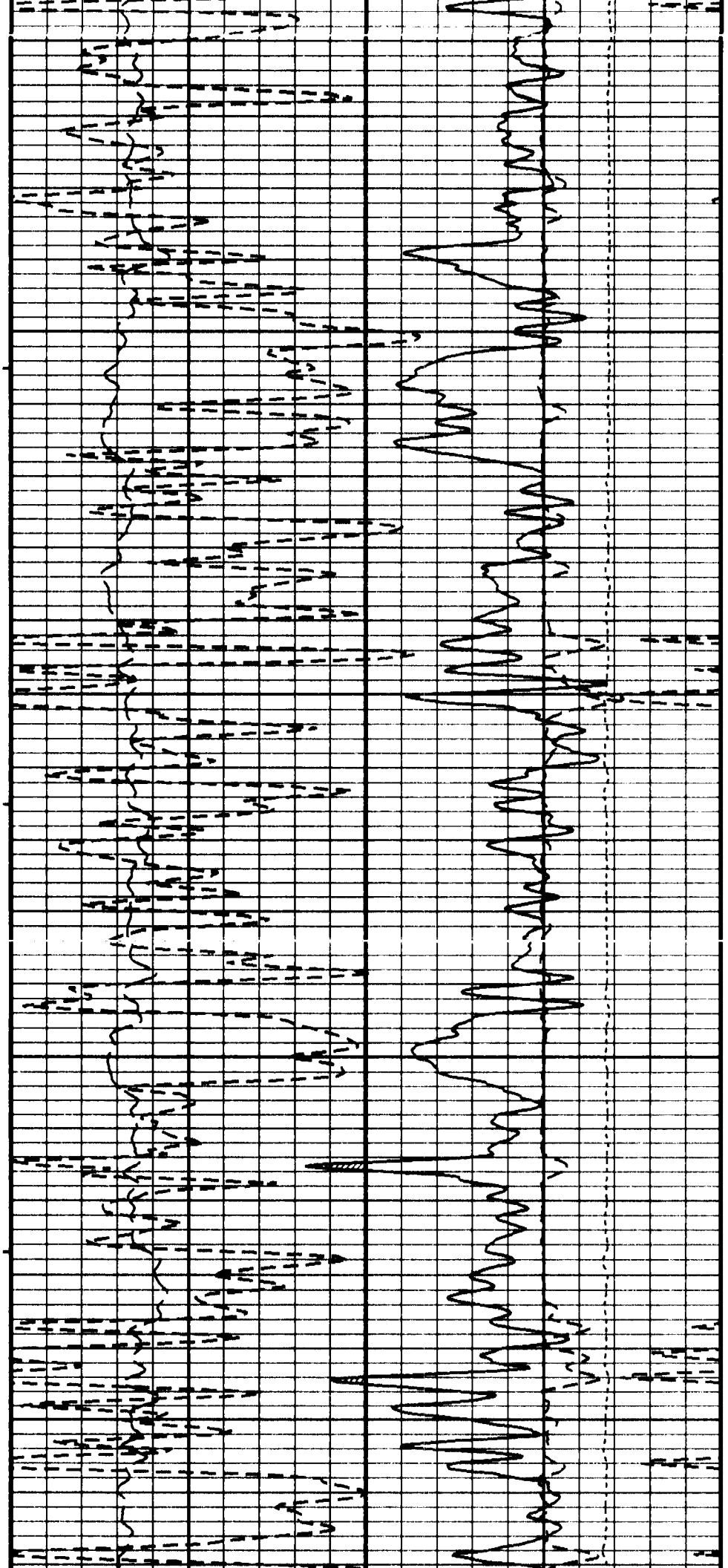




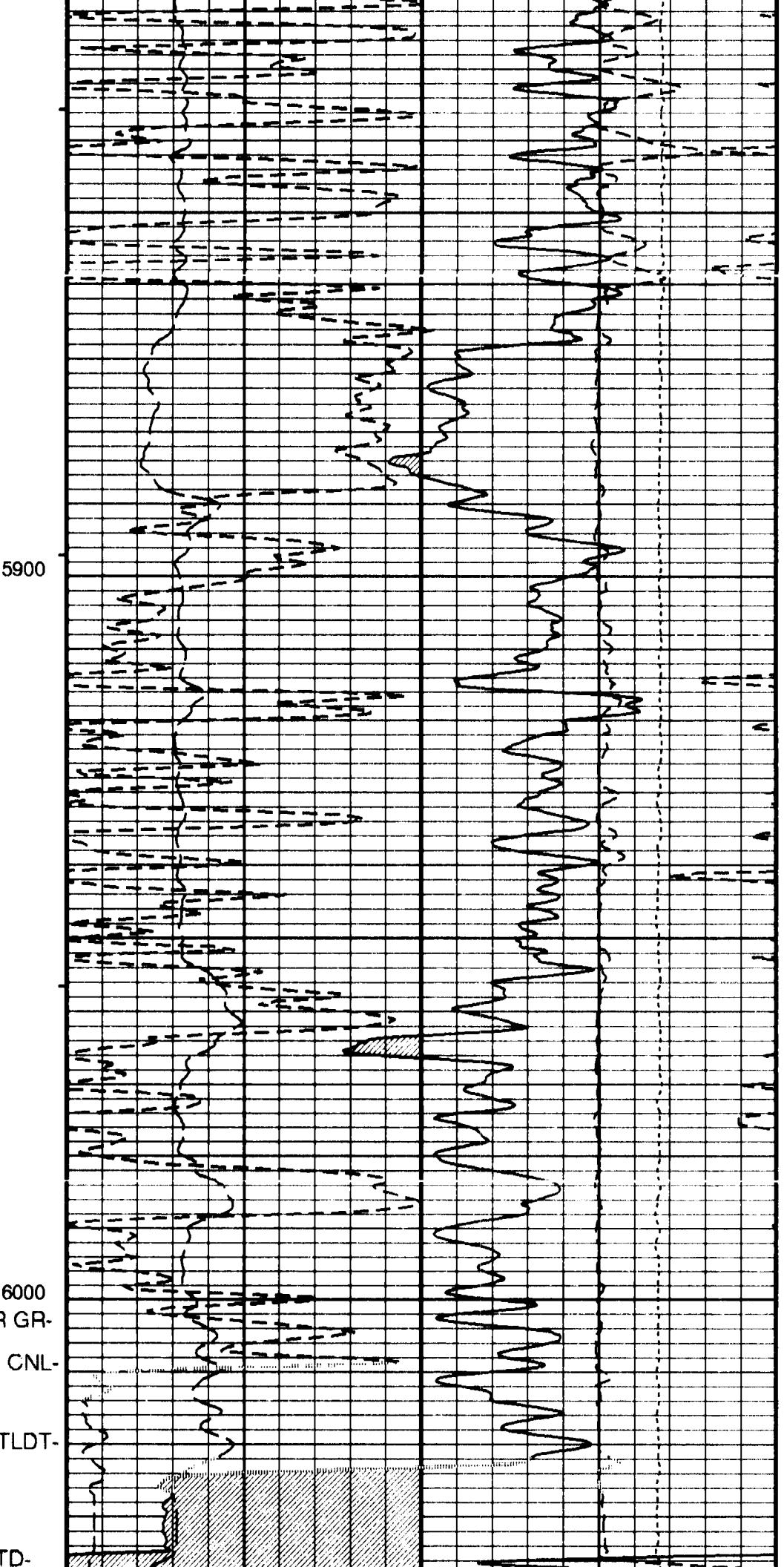


5700

5800



6000
-FR GR-
-FR CNL-
FR TLDT-
-TD-



Gamma Ray (GR)		Stuck Stretch (STIT)	Std. Res. Density Porosity (DPHZ)		
0	(GAPI) 200	0 (F) 50	0.3	(V/V)	-0.1
Caliper (HCAL)		Cable Drag From STIA to STIT	Alpha Processed Neutron Porosity (NPOR)		
6	(IN) 16	0.3	(V/V)		-0.1
Tool/Tot. Drag From D3T to STIA		Std. Res. Formation Po (PEFZ)	10	Density Correction (HDRA)	0.25
		0 (---)	-0.25	(G/C3)	
Std. Res. Density Standoff (DSOZ) (IN)		GAS EFFECT From DPHZ to NPOR			
	2.5 0.5	DPHZ >= 10 p.u. From DPHZ to SpareConstant			
MAIN PASS		10000	Tension (TENS)	(LBF)	0

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
BHFL	Borehole Fluid Type	WATER
BHS	Bore Hole Status	OPEN
BS	Bit Size	7.875 IN
BSAL	Borehole Salinity	700.00 PPM
BSCO	Borehole Salinity Correction Option	NO
CCCO	Casing & Cement Thickness Correction Option	NO
CWEI	Casing Weight	24.00 LB/F
DFD	Drilling Fluid Density	8.30 LB/G
DHC	Density Hole Correction	BS
FD	Fluid Density	1 G/C3
FSAL	Formation Salinity	-50000 PPM
FSCO	Formation Salinity Correction Option	NO
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	1.00000e-02 DF/F
HSCM	HILT Speed Correction Mode	NO SC
HSCO	Hole Size Correction Option	YES
HSTI	STI Uses HILT Acceleration	NO
MATR	Rock Matrix Type	SANDSTONE
MCCO	Mud Cake Correction Option	NO
MCOR	Mud Correction	NATU
MDEN	Matrix Density	2.68 G/C3
MST	Mud Sample Temperature	52.00 DEGF
MWCO	Mud Weight Correction Option	NO
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	StdProc
NSAR	HRDD Depth Sampling Rate	1 IN
PTCO	Pressure/Temperature Correction Option	NO
RMFS	Resistivity of Mud Filtrate Sample	4.2900 OHMM
SDAT	Standoff Data Source	SOCN
SHT	Surface Hole Temperature	68 DEGF
SOCN	Standoff Distance	0.125 IN
SOCO	Standoff Correction Option	YES
STKT	STI Stuck Threshold	4 FT

OP System Version: 7C0-712

DBM

HILTB-CTS
HOLEVRPCV-999
RPCV-999

RWA

RPCV-999

Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11

Input DLIS Files

DEFAULT	HILTC .006	FN:5	FIELD	4-MAR-1998 14:13	6060.0 FT	5667.5 FT
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Output DLIS Files

DEFAULT	HILTC .007	FN:7	FIELD	4-MAR-1998 14:36
POCI	HILTC .007	FN:8	CUST	4-MAR-1998 14:36

Integrated Hole/Cement Volume Summary

Hole Volume = 122.07 F3

Cement Volume = 58.55 F3 (assuming 5.50 IN casing O.D.)

Computed from 6060.0 FT to 5727.0 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

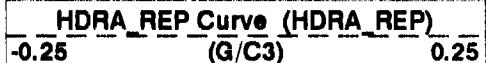
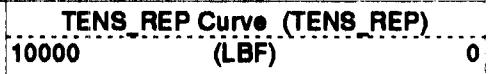
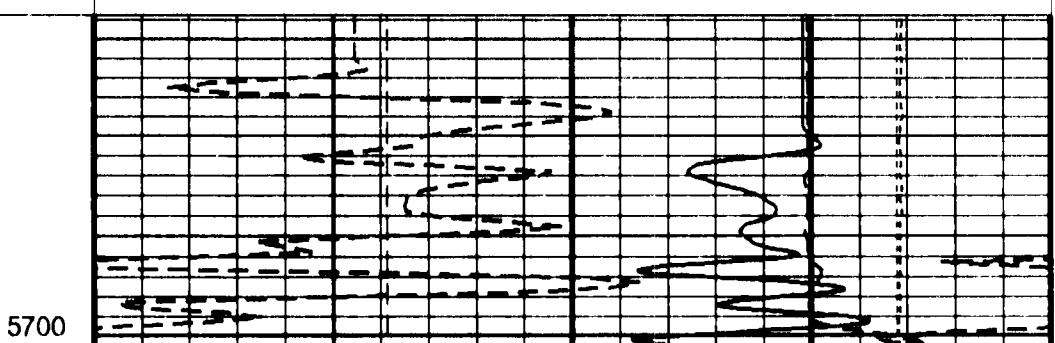
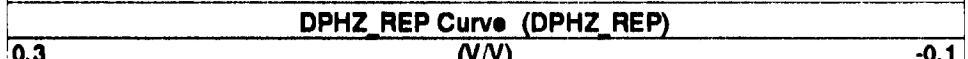
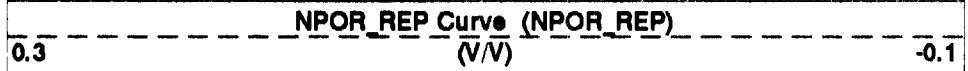
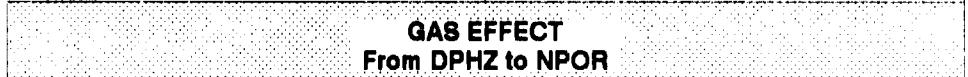
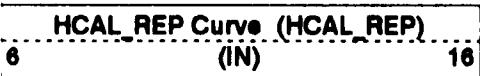
HILTB-CTS
HOLEVRPCV-999
RPCV-999

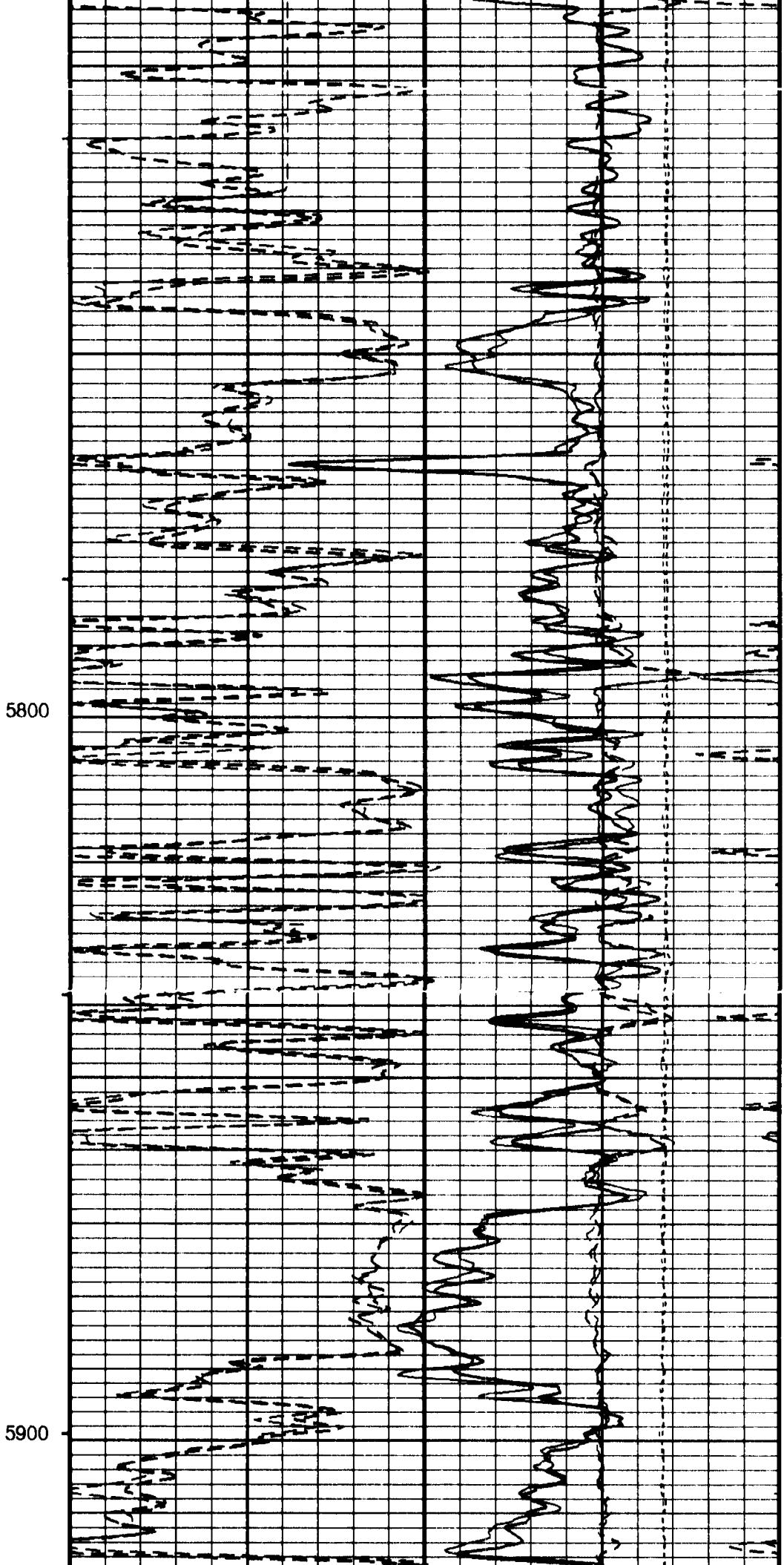
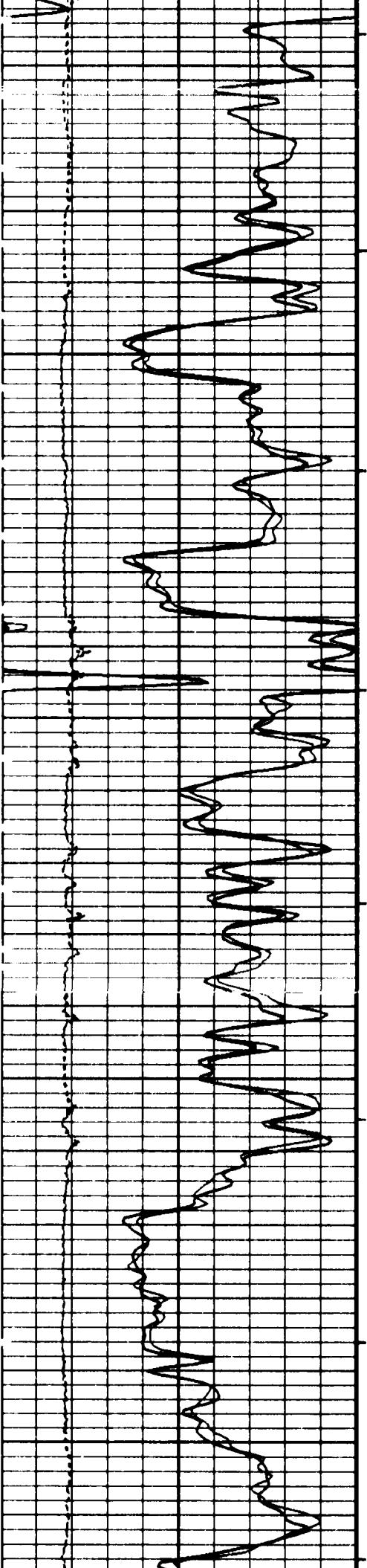
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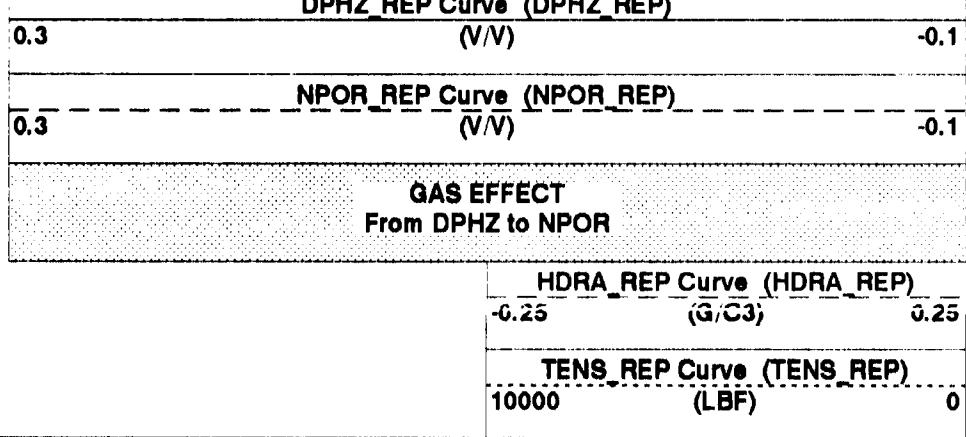
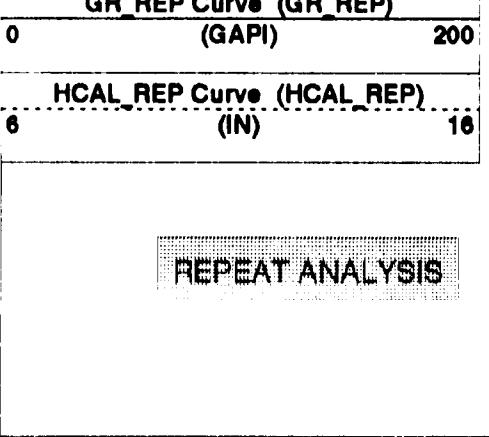
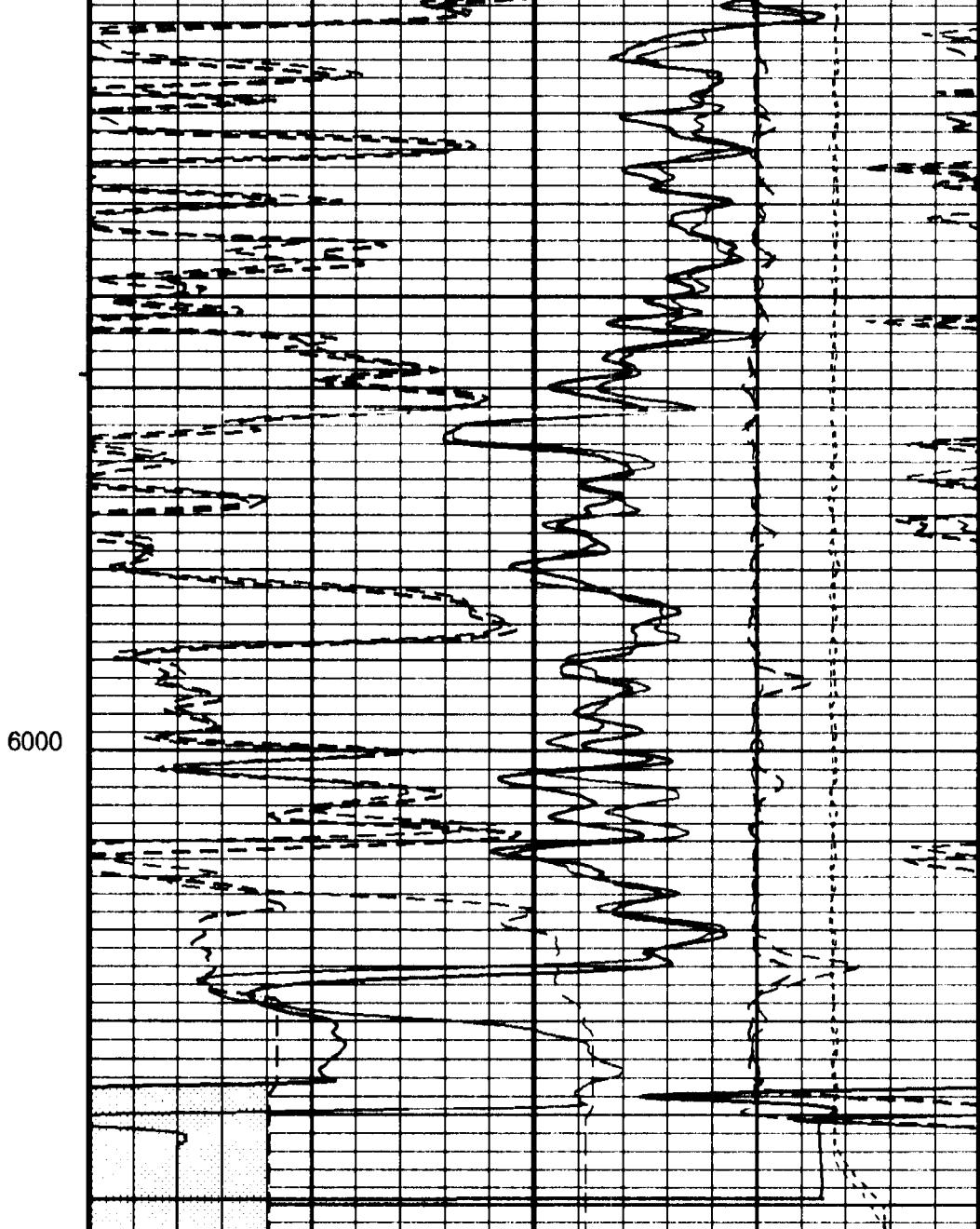
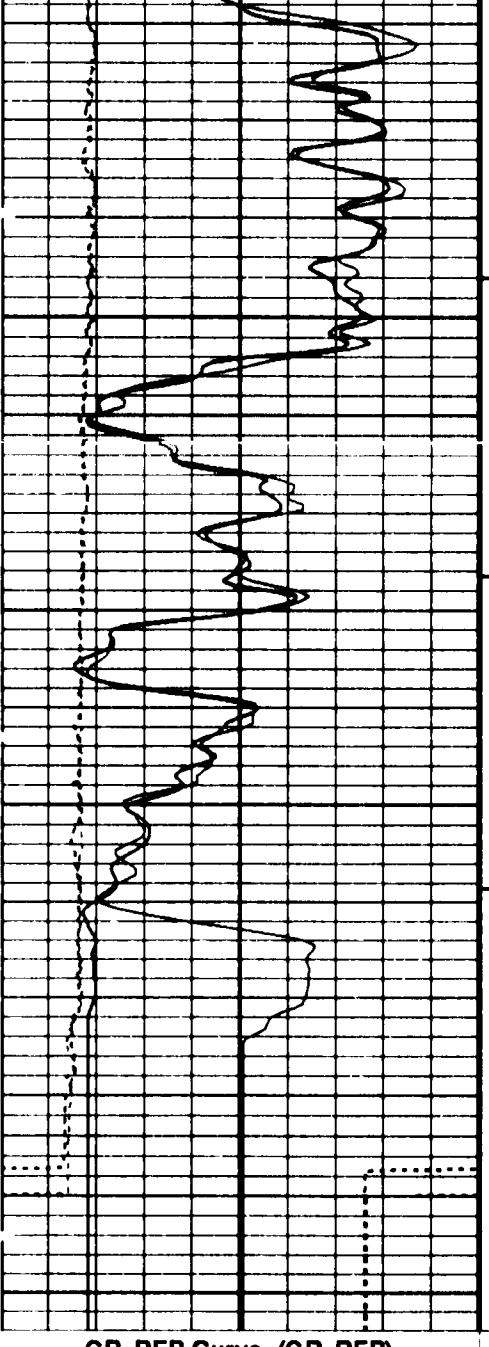
RPCV-999

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - └ Integrated Cement Volume Minor Pip Every 10 F3
 - └ Integrated Cement Volume Major Pip Every 100 F3

 Time Mark Every 60 S**REPEAT ANALYSIS**





PIP SUMMARY

- ─ Integrated Hole Volume Minor Pip Every 10 F3
- ─ Integrated Hole Volume Major Pip Every 100 F3
 - ─ Integrated Cement Volume Minor Pip Every 10 F3
 - ─ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name

Description

Value

BHFL	Borehole Fluid Type	WATER
BHS	Bore Hole Status	OPEN
BS	Bit Size	7.875
BSAL	Borehole Salinity	IN
BSCO	Borehole Salinity Correction Option	700.00
CCCO	Casing & Cement Thickness Correction Option	PPM
CWEI	Casing Weight	NO
DFD	Drilling Fluid Density	NO
DHC	Density Hole Correction	24.00
DORL	Depth Offset Repeat Analysis	LB/F
FD	Fluid Density	8.30
FSAL	Formation Salinity	LB/G
FSCO	Formation Salinity Correction Option	BS
GCSE	Generalized Caliper Selection	0.0
GDEV	Average Angular Deviation of Borehole from Normal	FT
GGRD	Geothermal Gradient	1
HSCM	HILT Speed Correction Mode	G/C3
HSCO	Hole Size Correction Option	-50000
HSTI	STI Uses HILT Acceleration	PPM
MATR	Rock Matrix Type	HCAL
MCCO	Mud Cake Correction Option	0
MCOR	Mud Correction	DEG
MDEN	Matrix Density	DF/F
MST	Mud Sample Temperature	NO
MWCO	Mud Weight Correction Option	NATU
NMT	HILT Nuclear Mud Type	2.68
NPRM	HRDD Processing Mode	52.00
NSAR	HRDD Depth Sampling Rate	NO
PTCO	Pressure/Temperature Correction Option	1
RMFS	Resistivity of Mud Filtrate Sample	4.2900
SDAT	Standoff Data Source	CHMM
SHT	Surface Hole Temperature	SOCN
SOCN	Standoff Distance	68
SOCO	Standoff Correction Option	0.125
		IN

Format: PORO_REP Vertical Scale: 5' per 100'

Graphics File Created: 4-MAR-1998 14:36

OP System Version: 7C0-712 DBM

HILTB-CTS	RPCV-999	RWA	RPCV-999
HOLEV	RPCV-999		

Input DLIS Files

DEFAULT	HILTC .006	FN:5	FIELD	4-MAR-1998 14:13	6060.0 FT	5667.5 FT
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Output DLIS Files

DEFAULT	HILTC .007	FN:7	FIELD	4-MAR-1998 14:36
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Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11	6054.0 FT	78.0 FT
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11	6054.0 FT	78.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2171.45 F3

Cement Volume = 1217.93 F3 (assuming 5.50 IN casing O.D.)

Computed from 6054.0 FT to 275.0 FT using data channel(s) HCAL

OP System Version: 7C0-712 DBM

HILTB-CTS	RPCV-999	RWA	RPCV-999
HOLEV	RPCV-999		

PiP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

MAIN PASS

SANDSTONE MATRIX: 2.68 G/CC

Tension (TENS)

10000

(LBF)

0

Dolomite/Shale
From RHT1 to
MP3

Density Correction (HDRA)
-0.25 (G/C3) 0.25

Caliper (HCAL)
6 (IN) 16

Quartz
From MP2 to
RHT1

Tool/Tot.
Drag
From D3T
to STIA

Std. Res. Formation Density (RHOZ)

(G/C3)

3

Gamma Ray (GR)
0 (GAPI) 200

Calcite
From MP3 to MP2

Stuck
Stretch
(STIT)
0 (F) 50

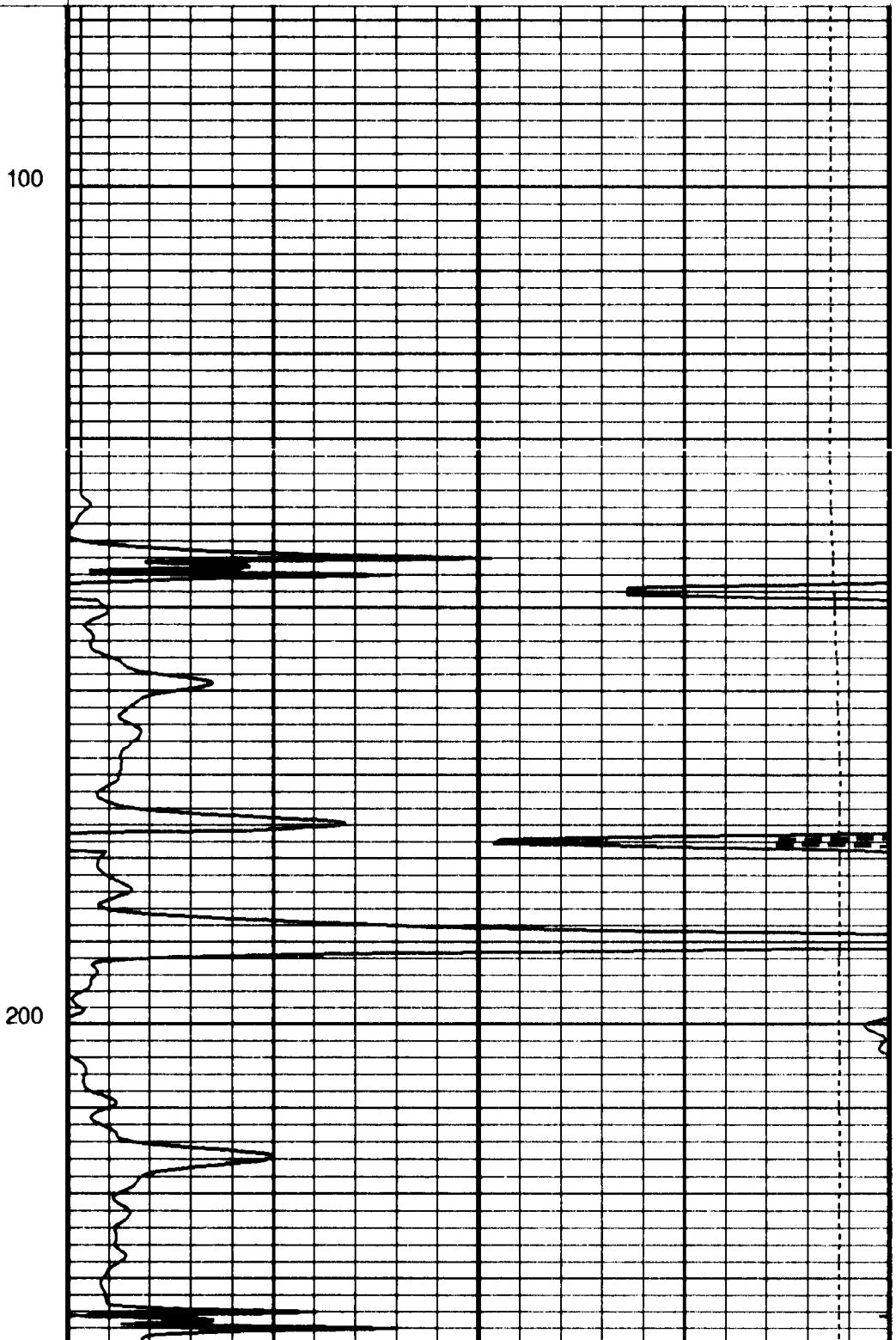
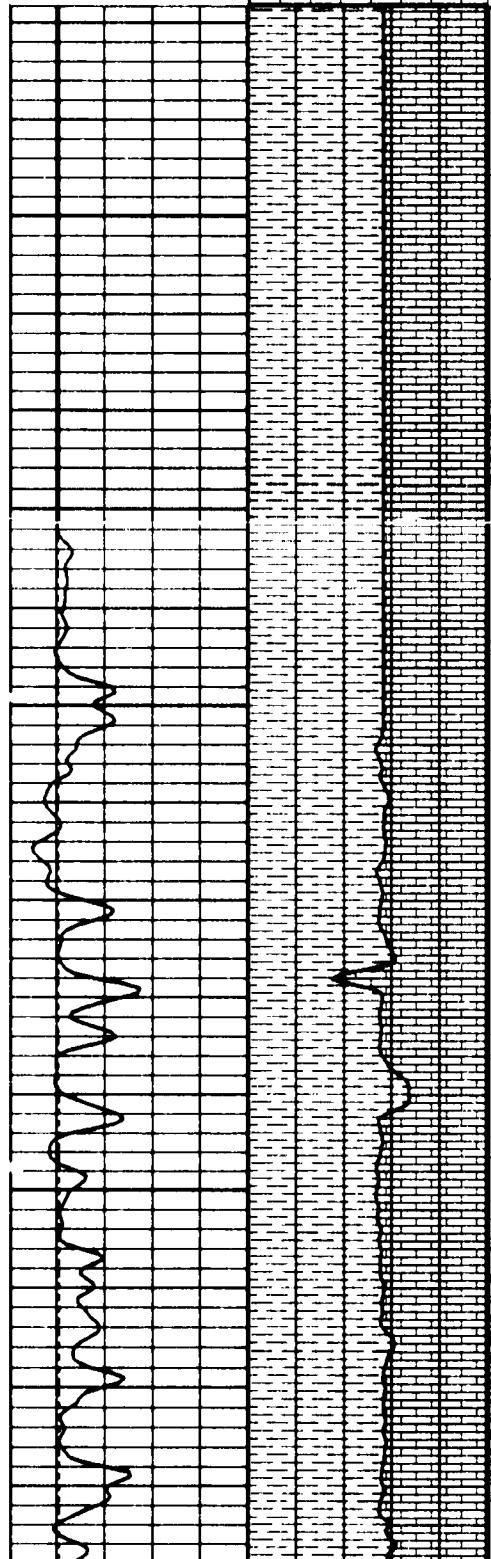
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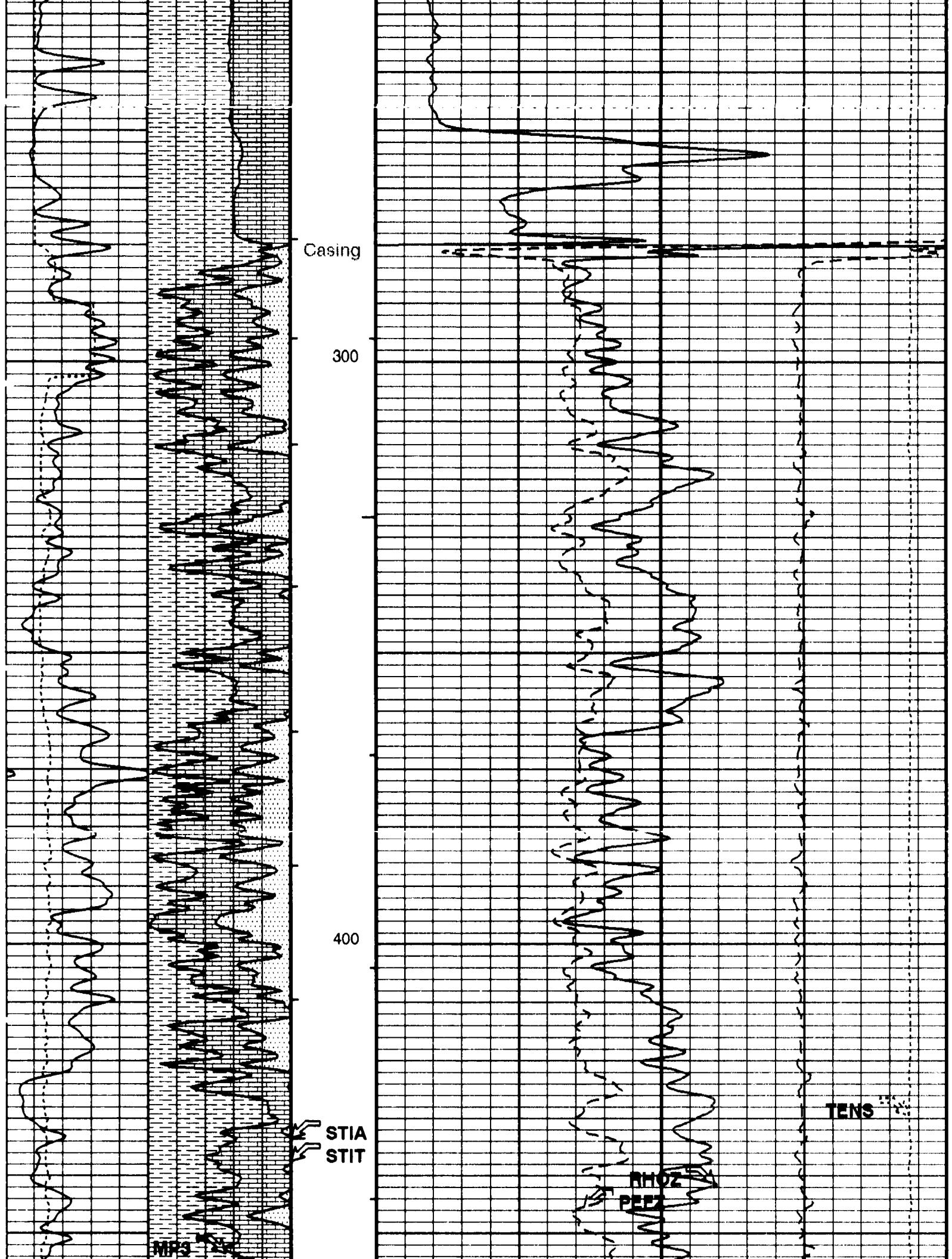
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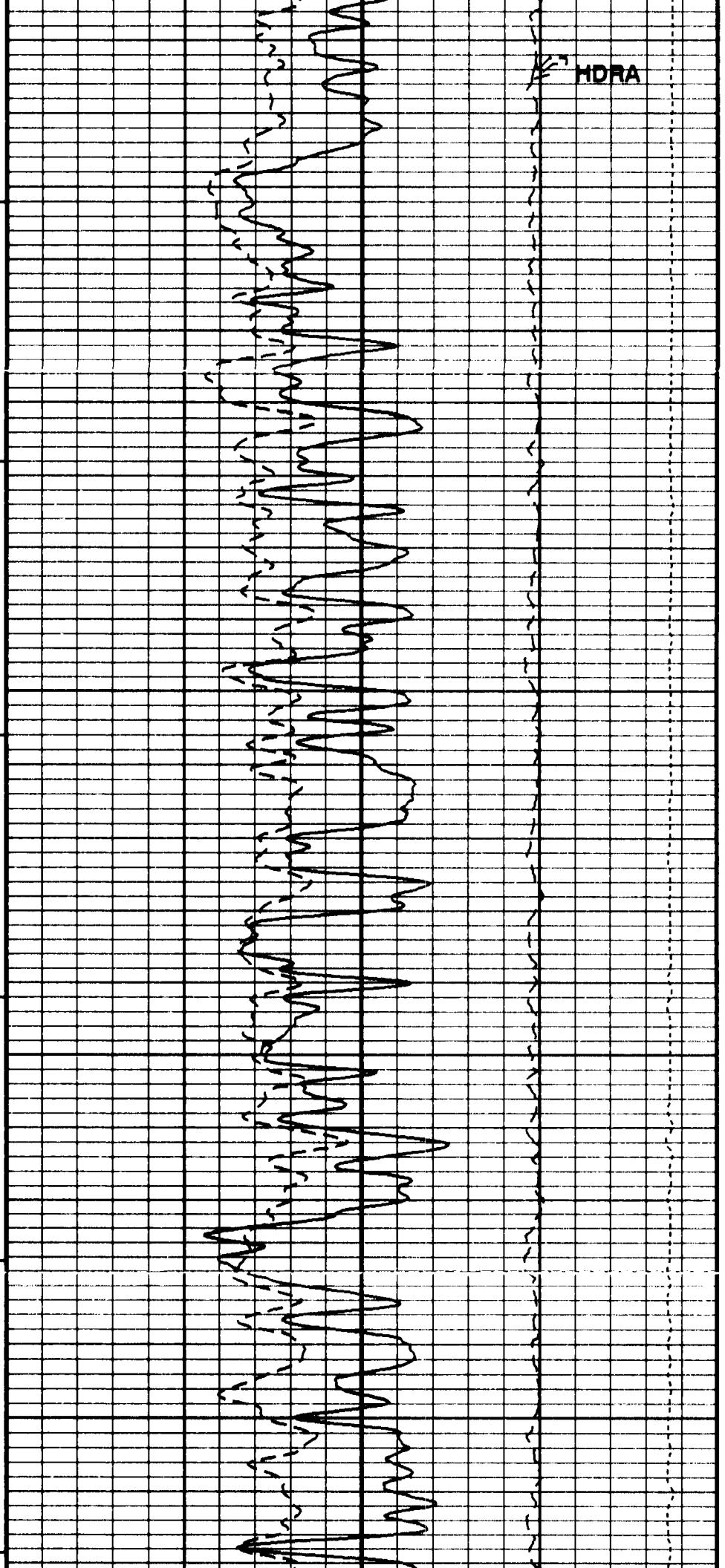
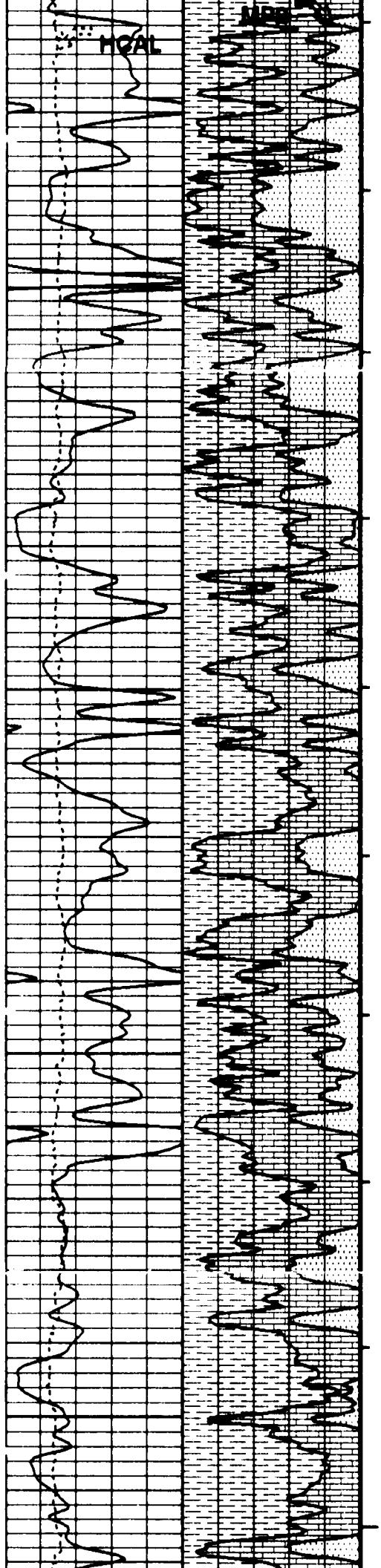
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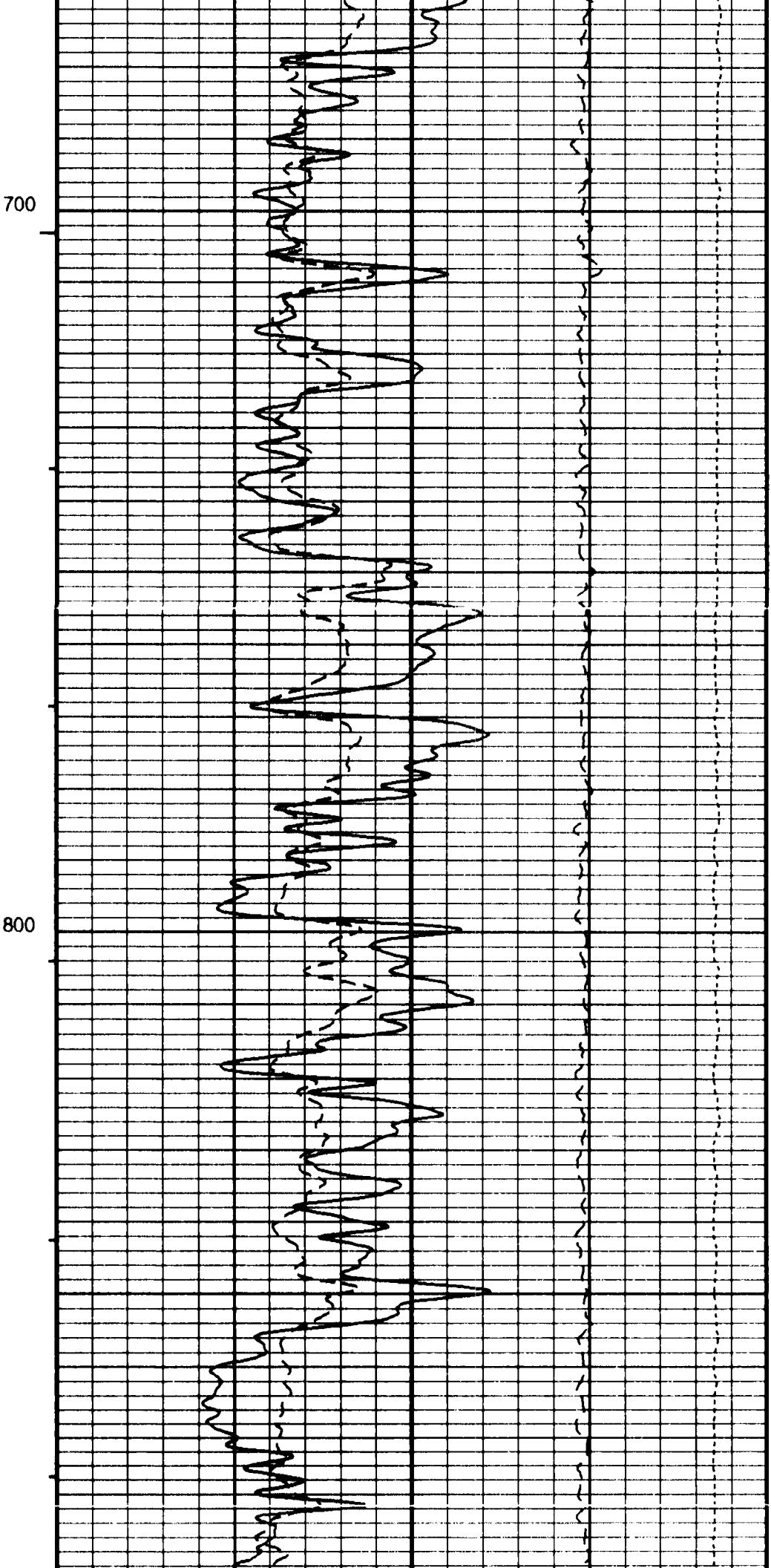
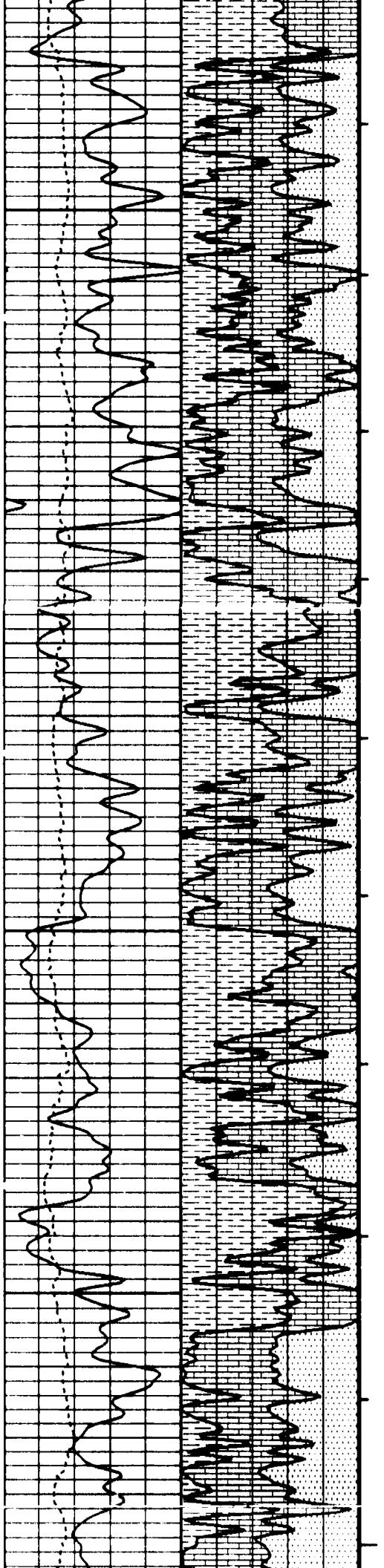
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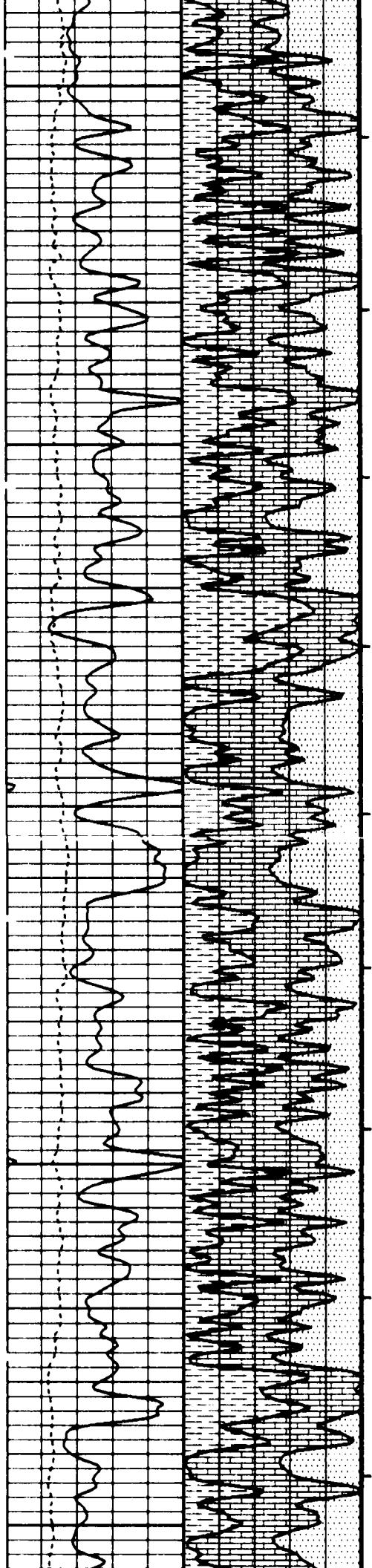
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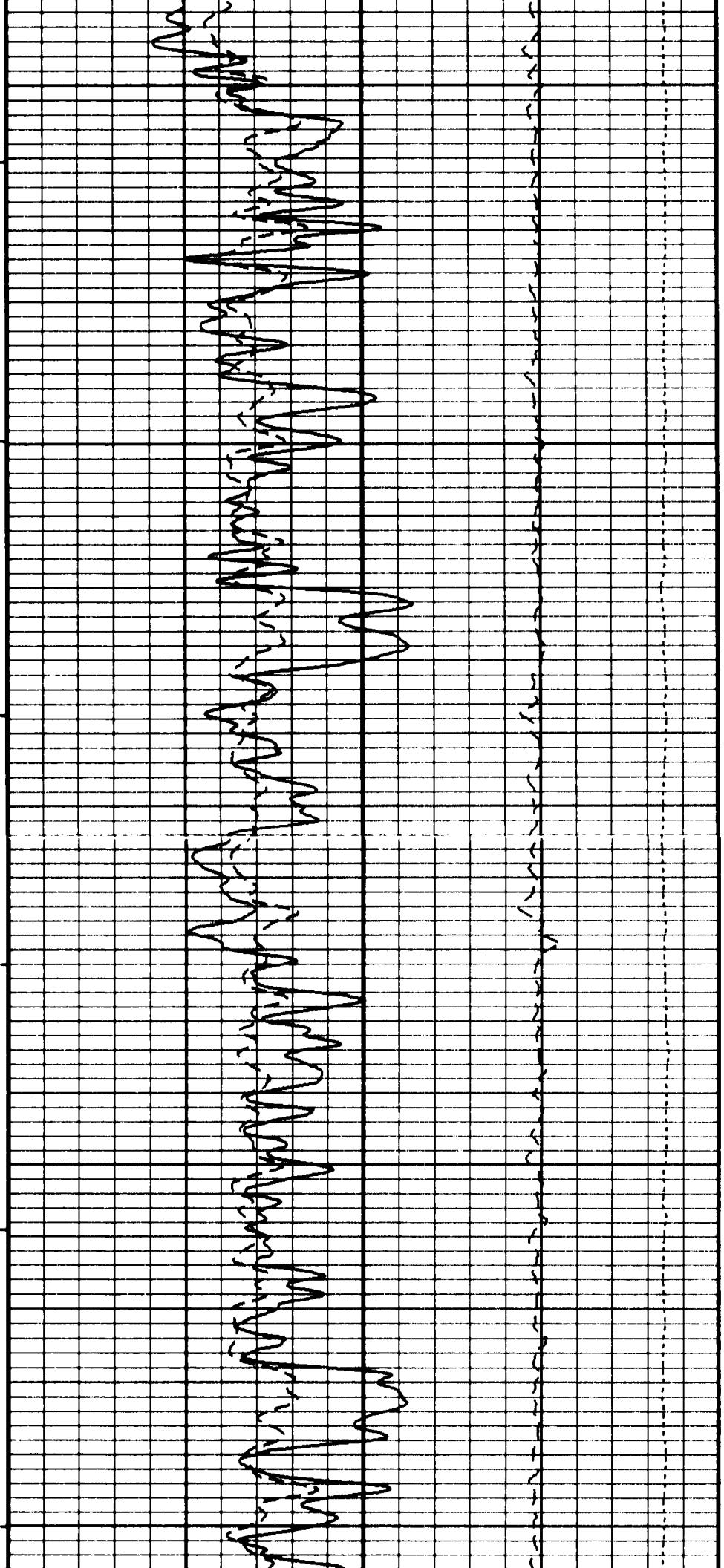


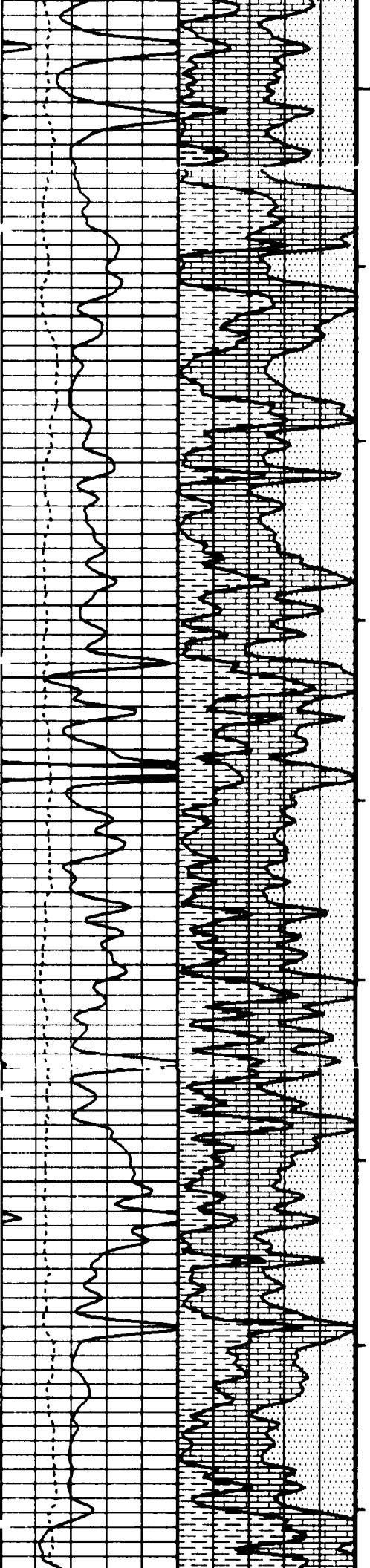


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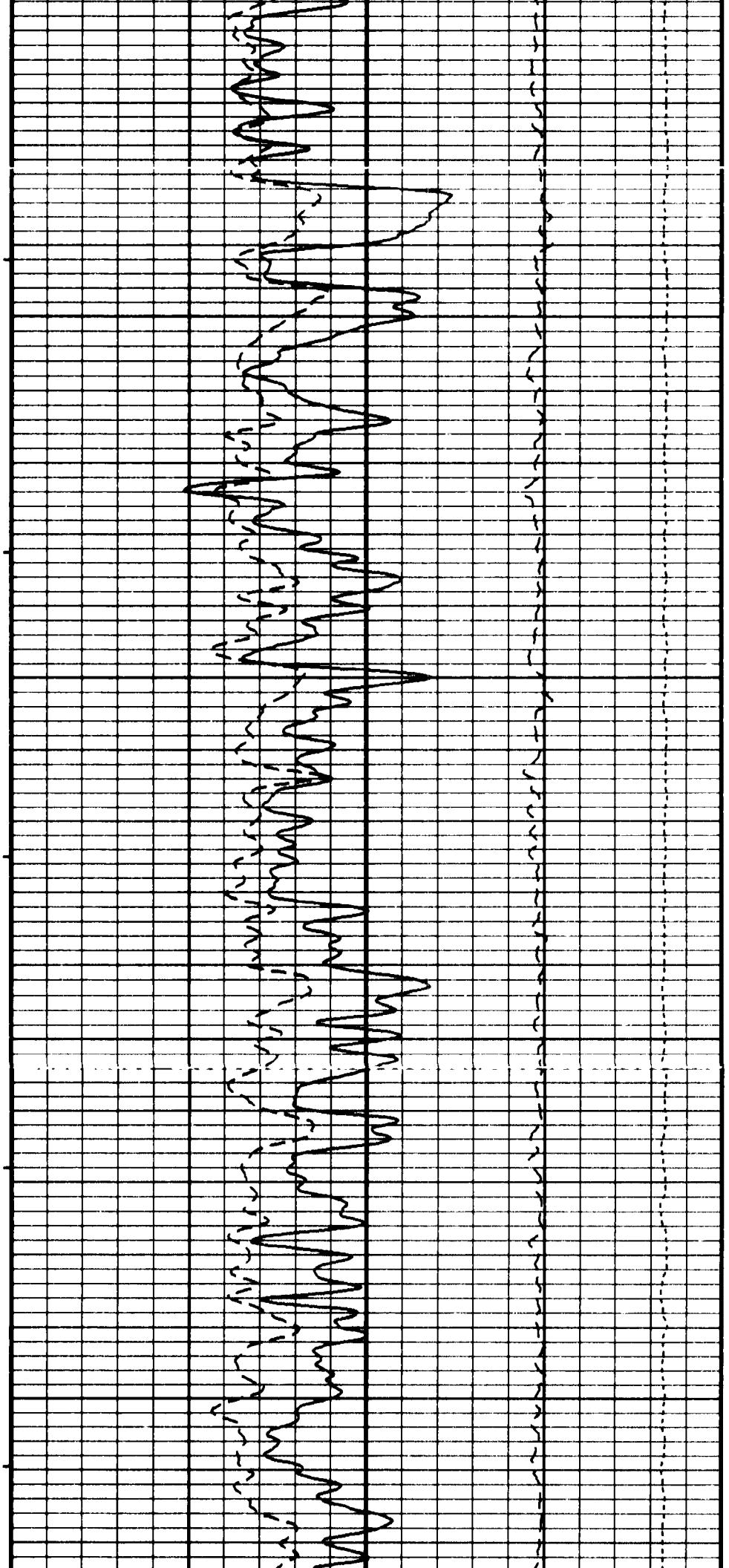
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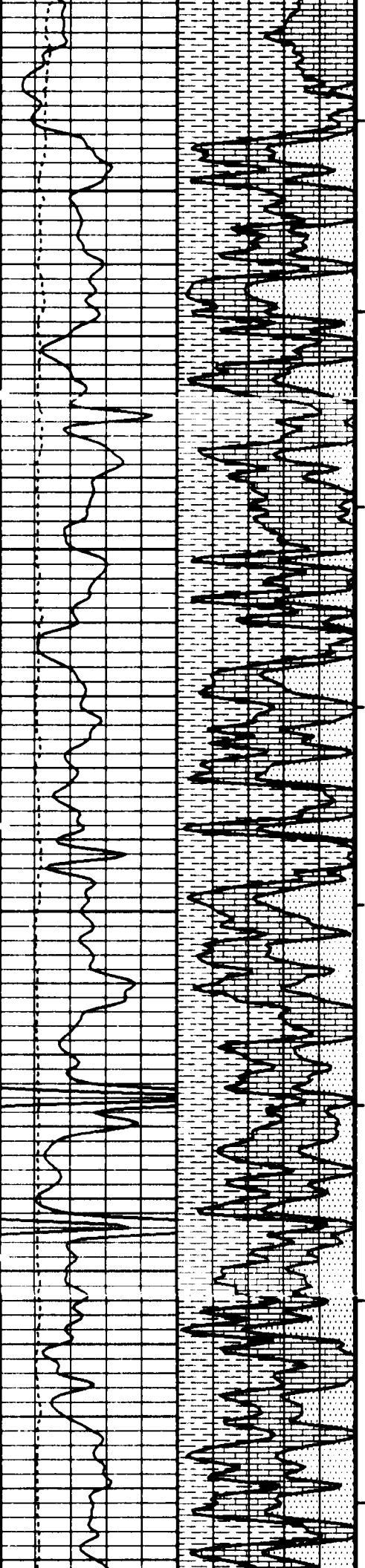




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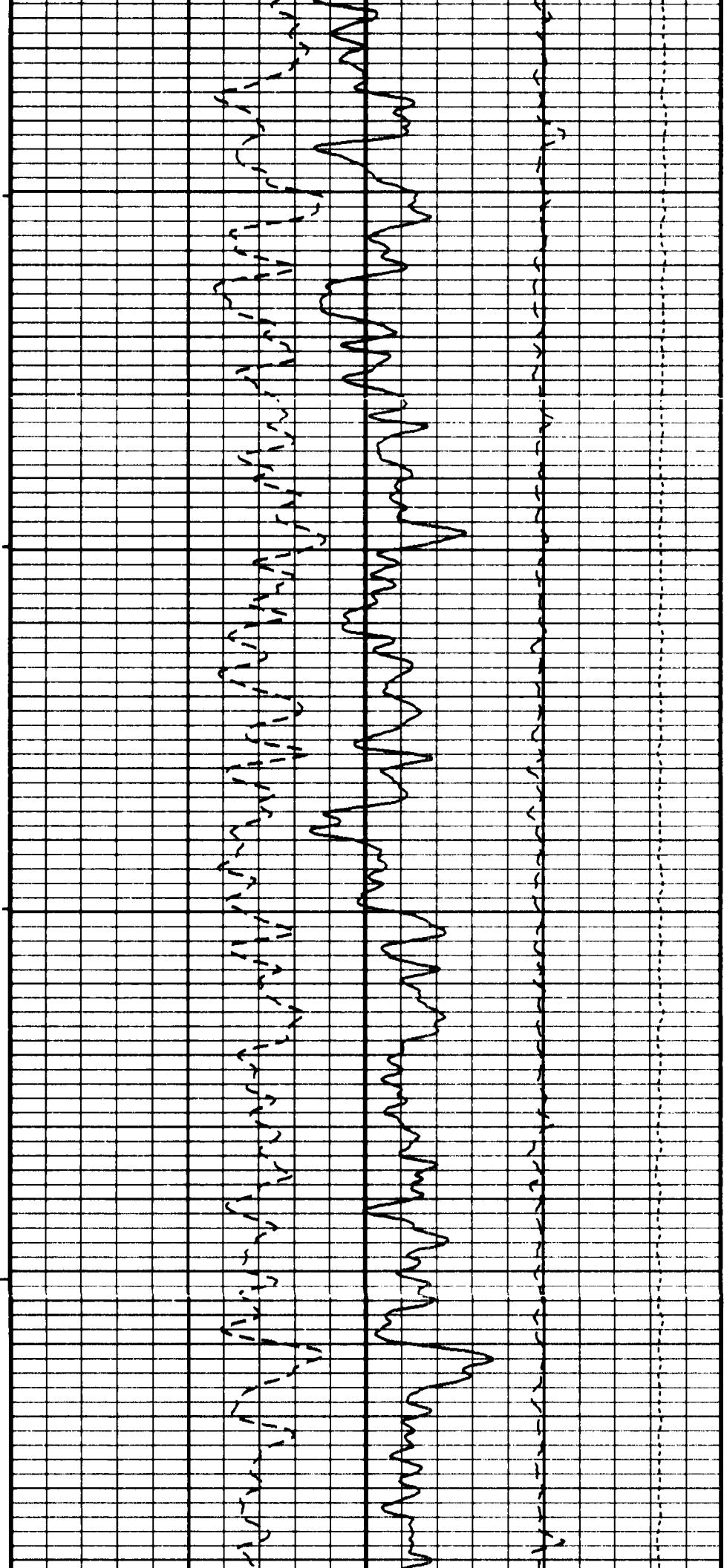
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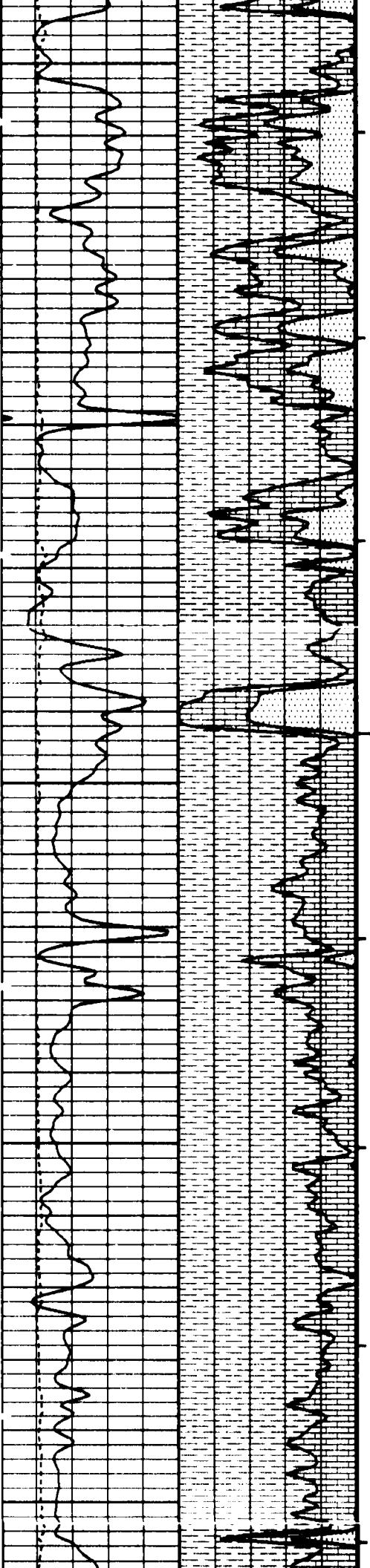




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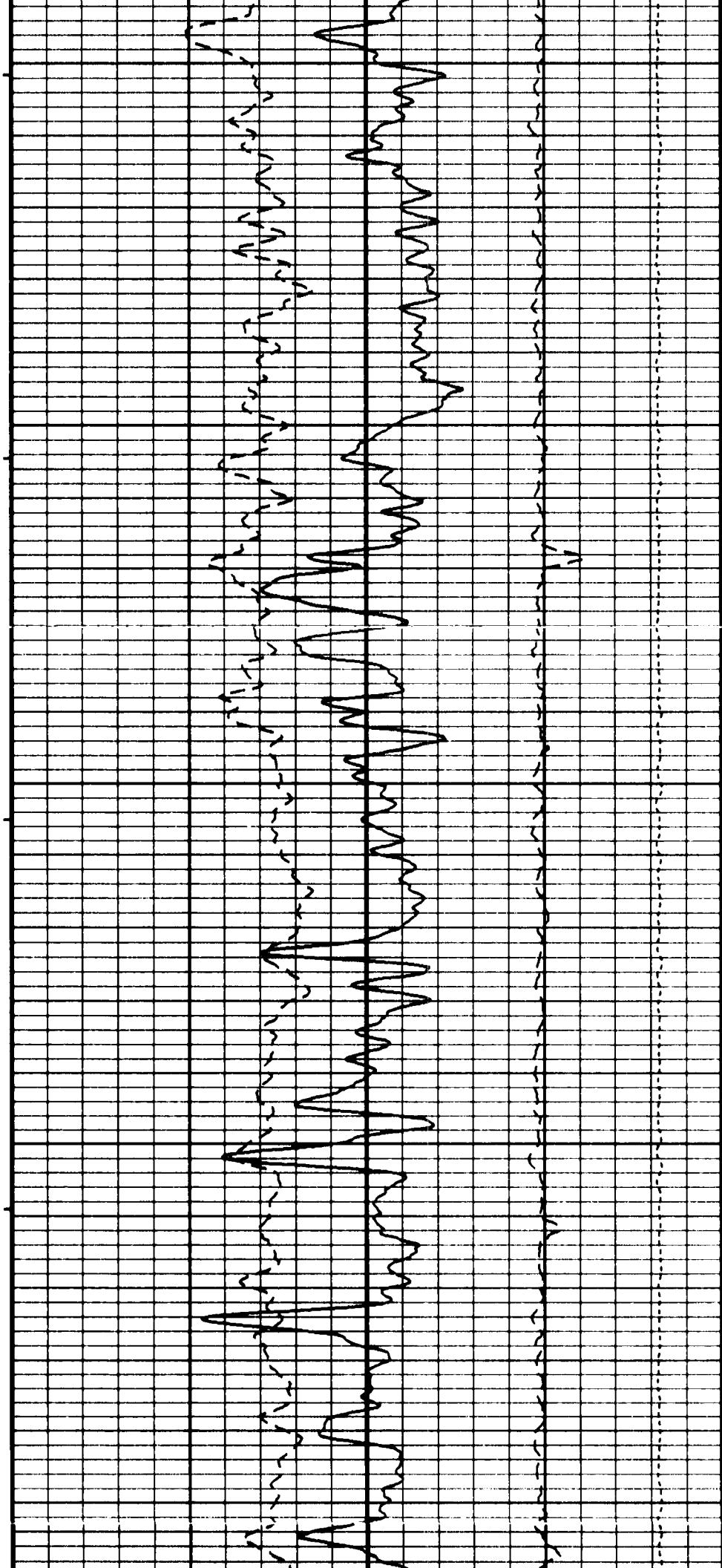
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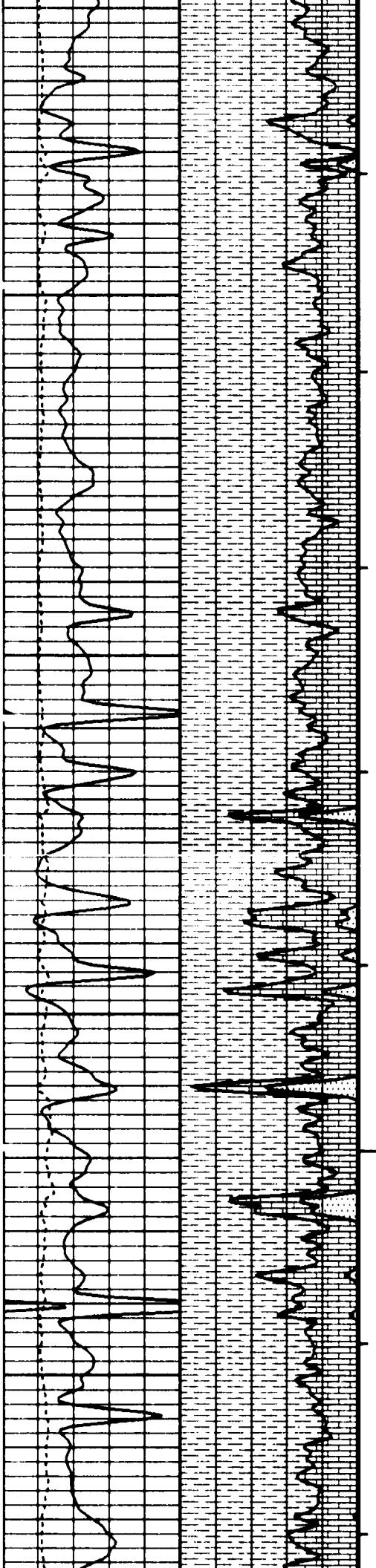




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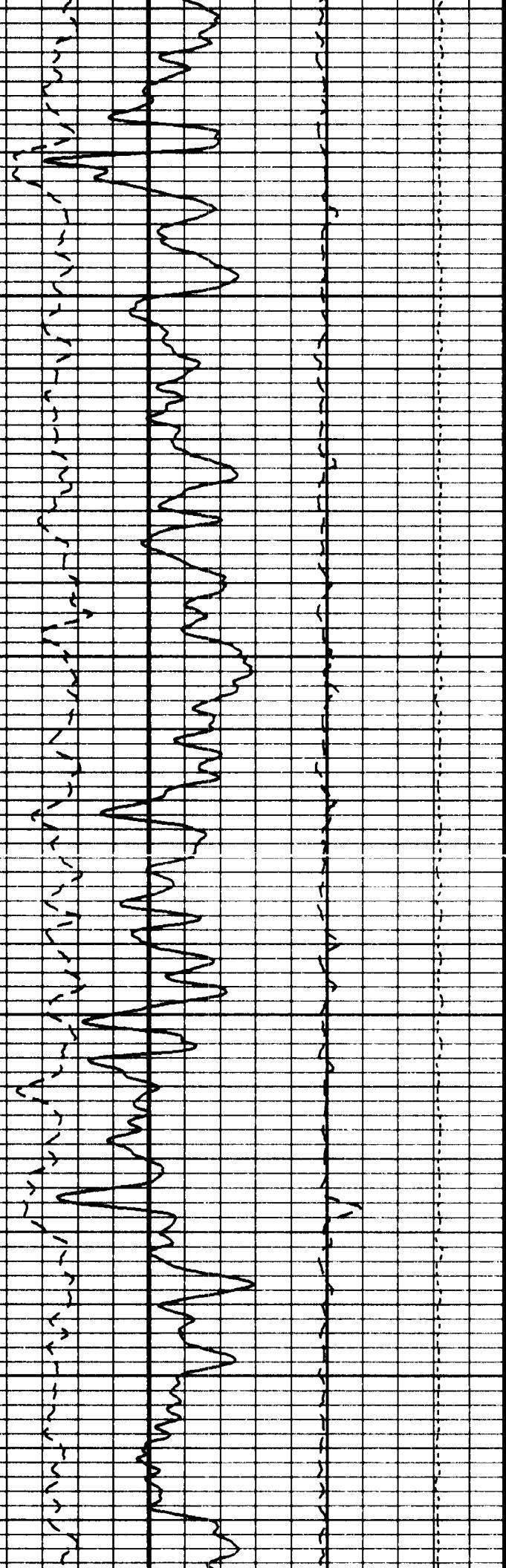
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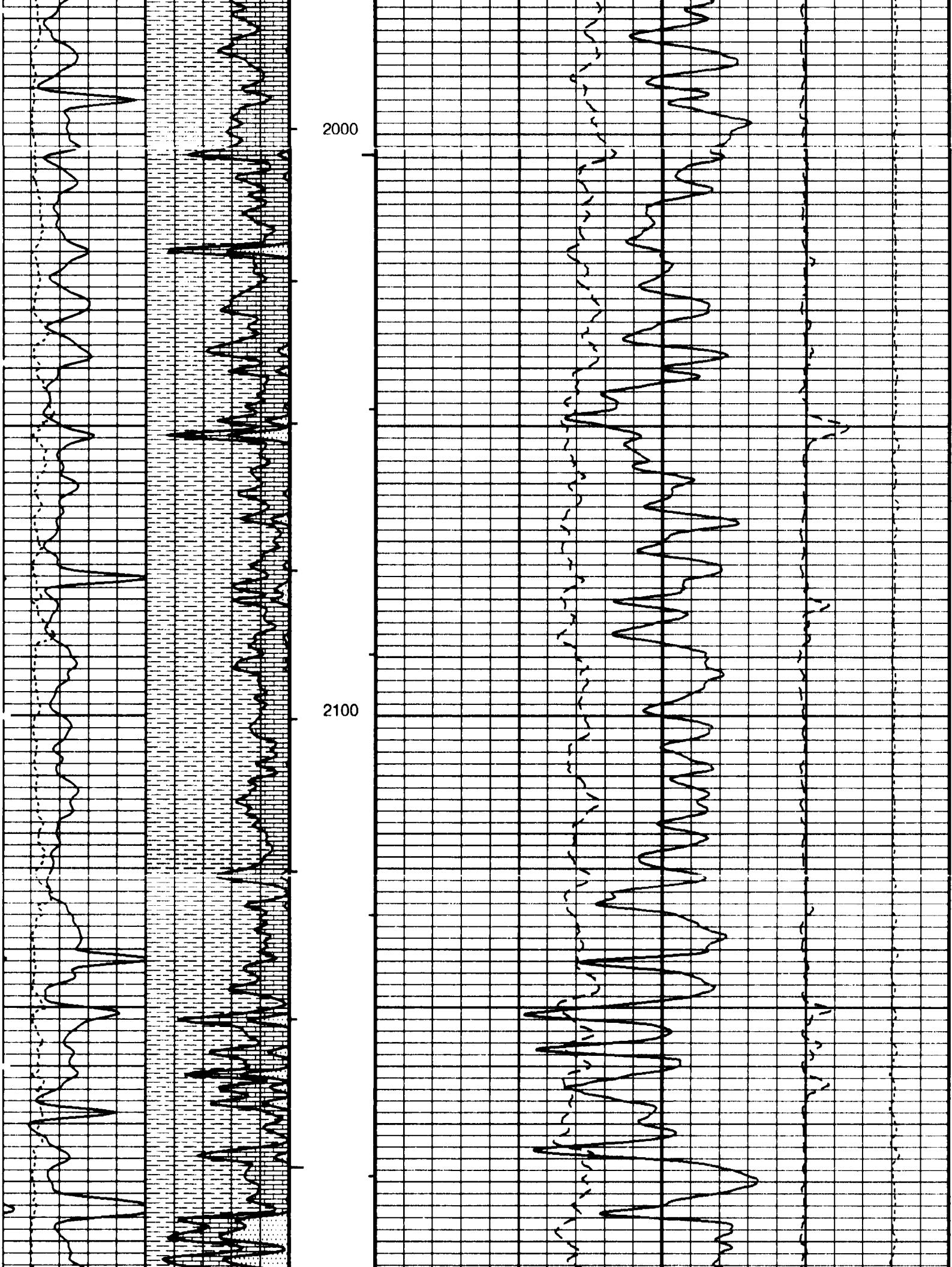


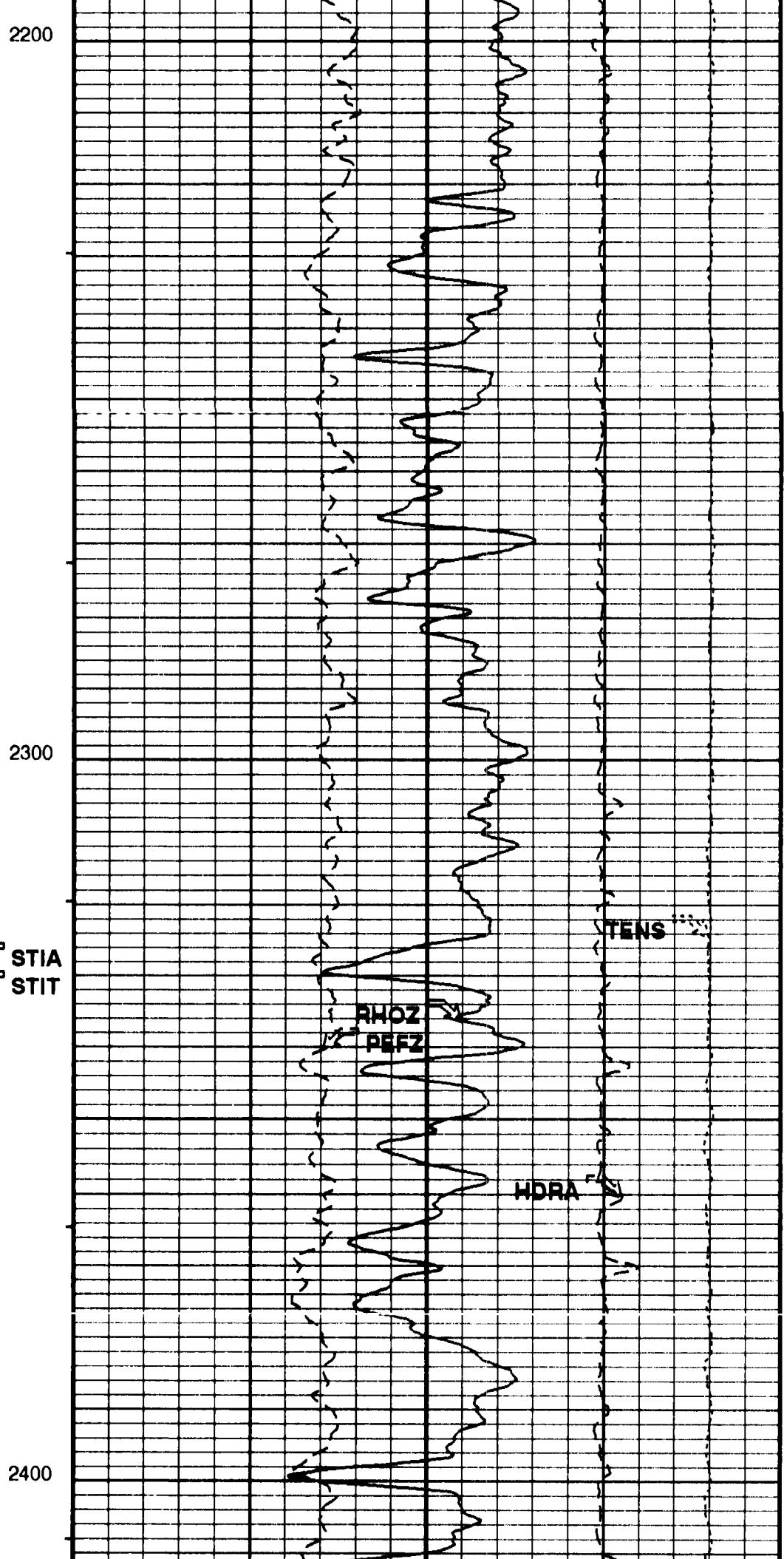
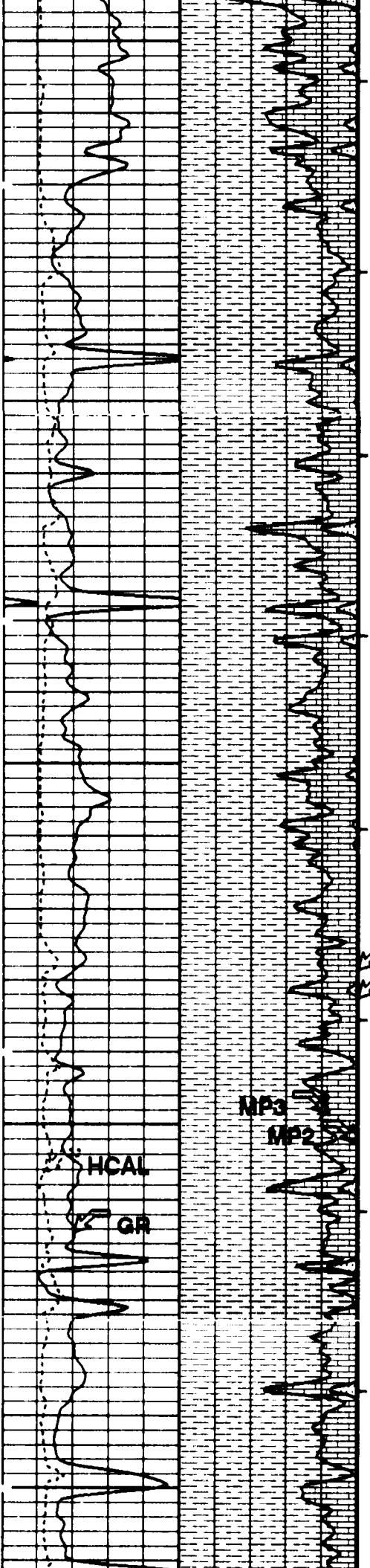


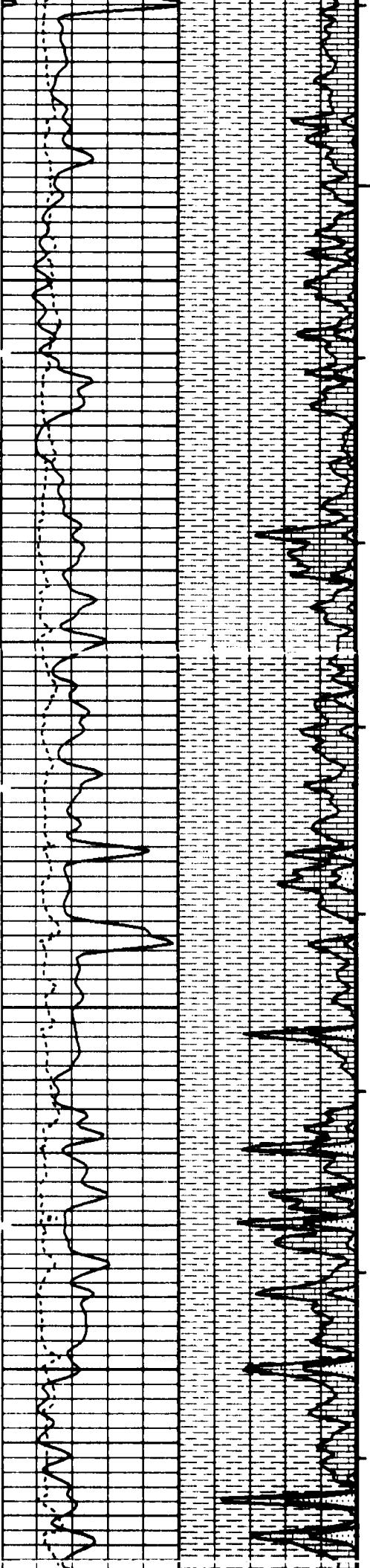
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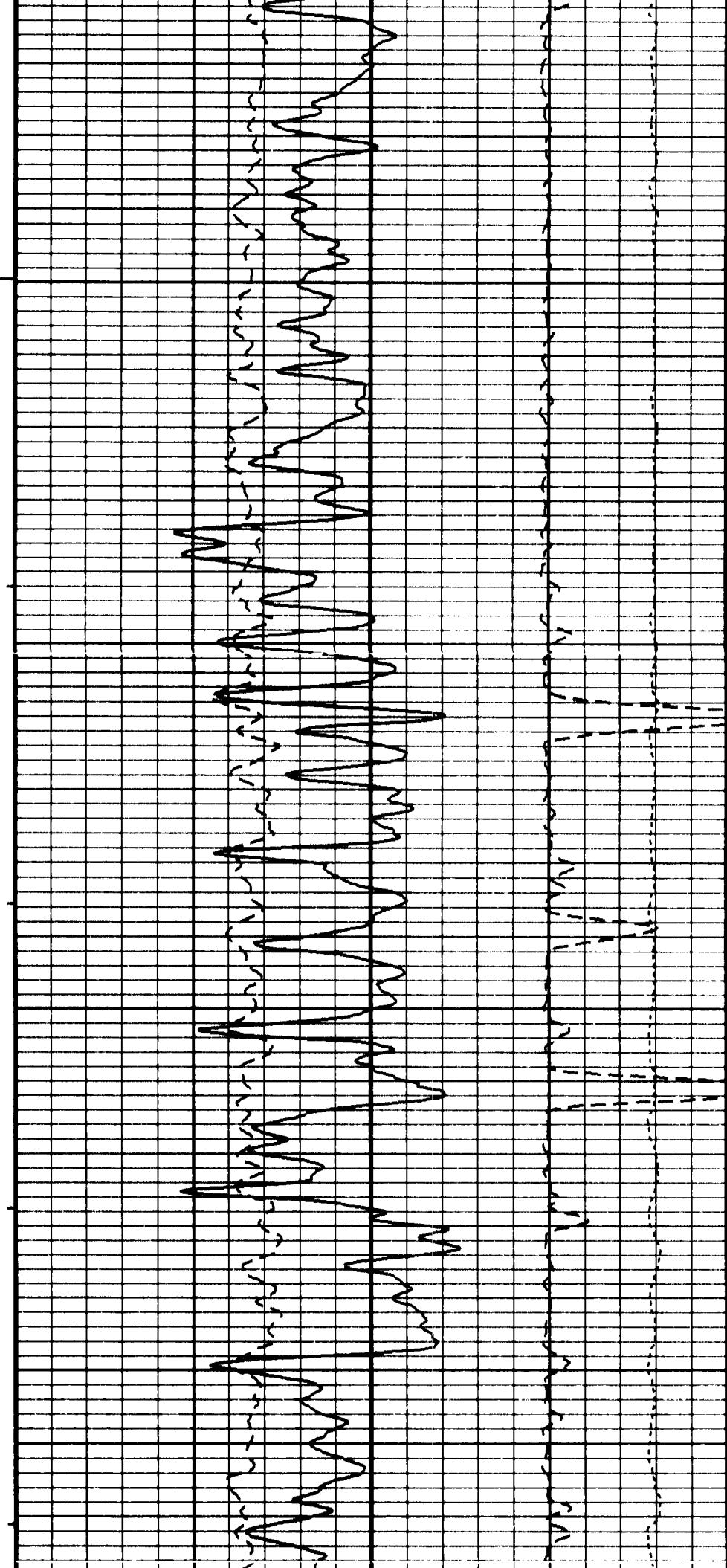


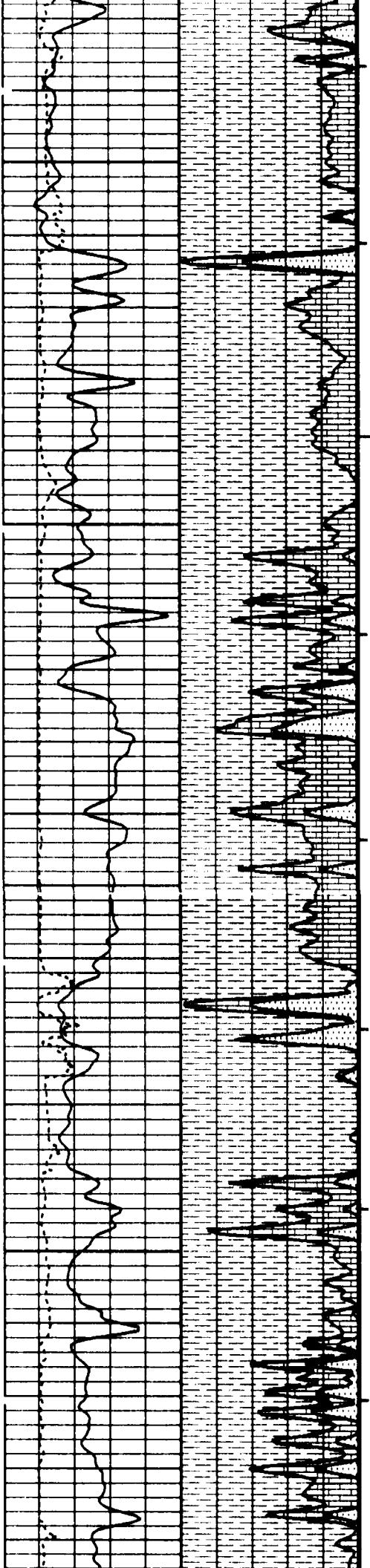




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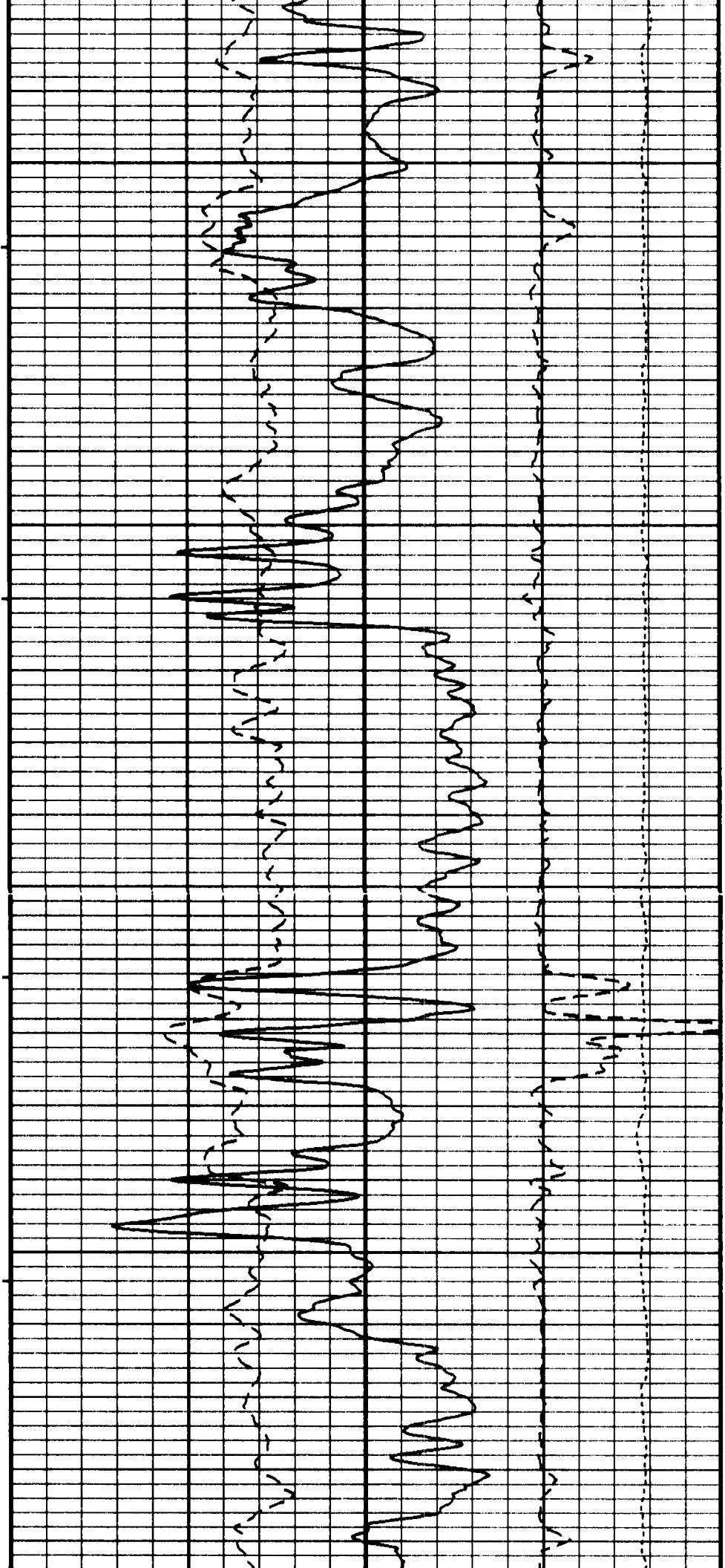
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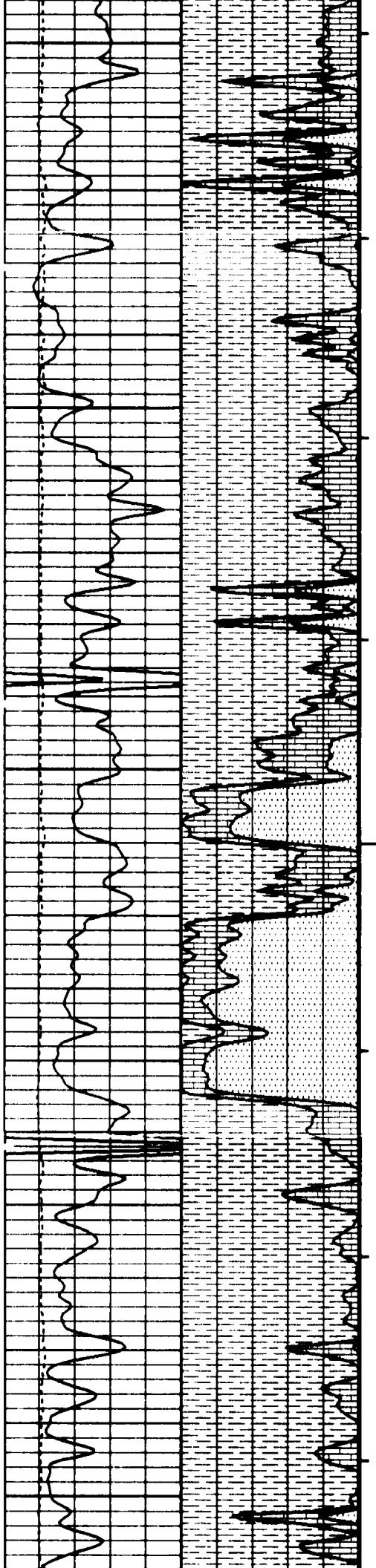




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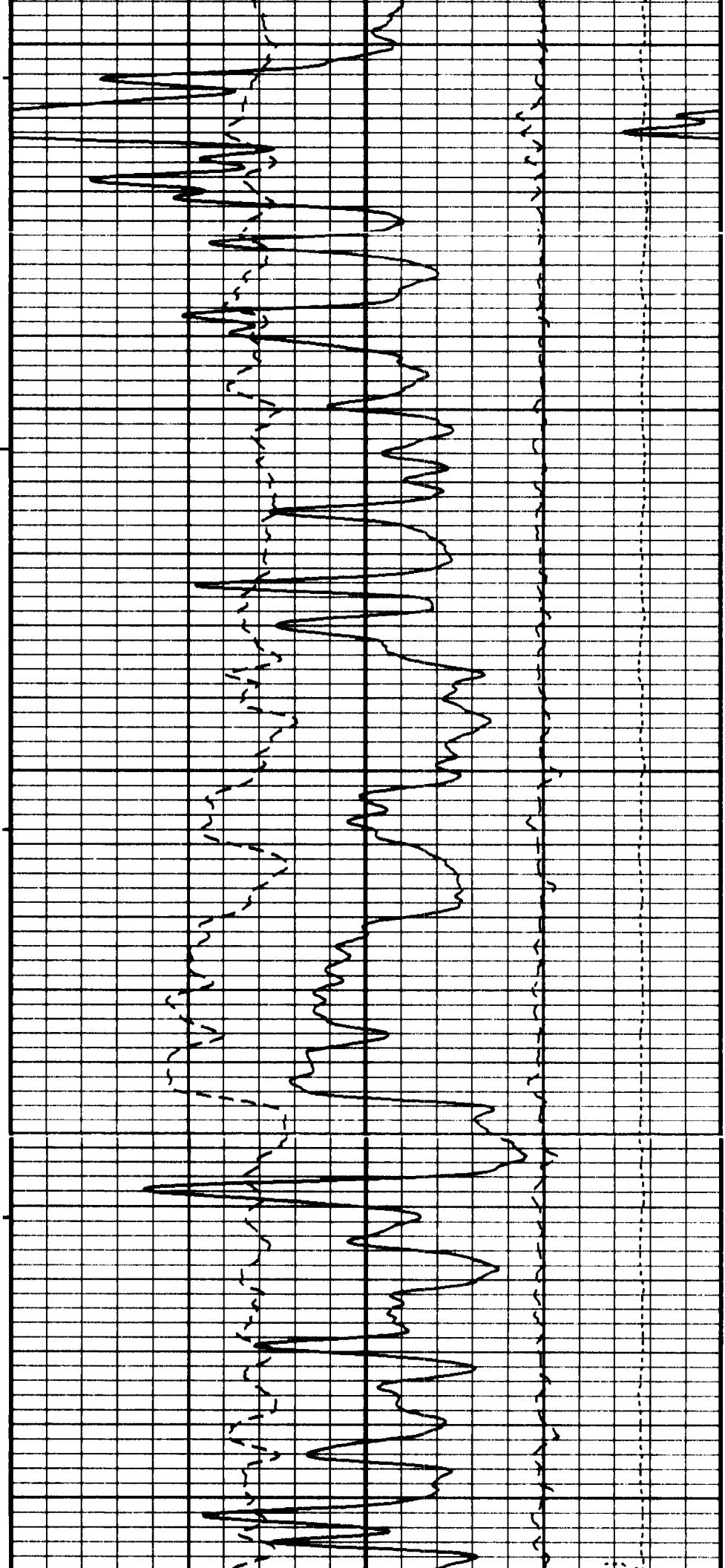
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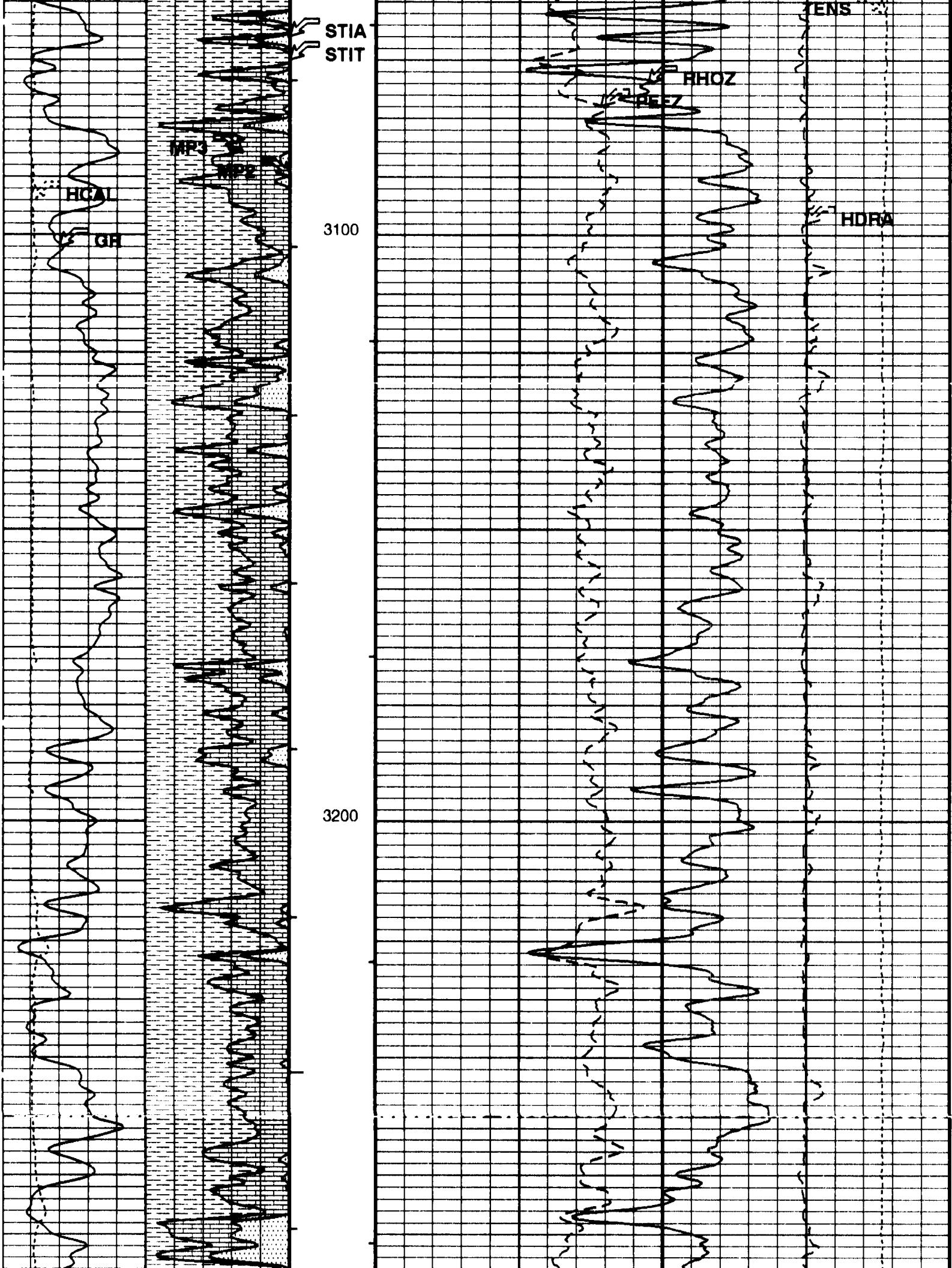


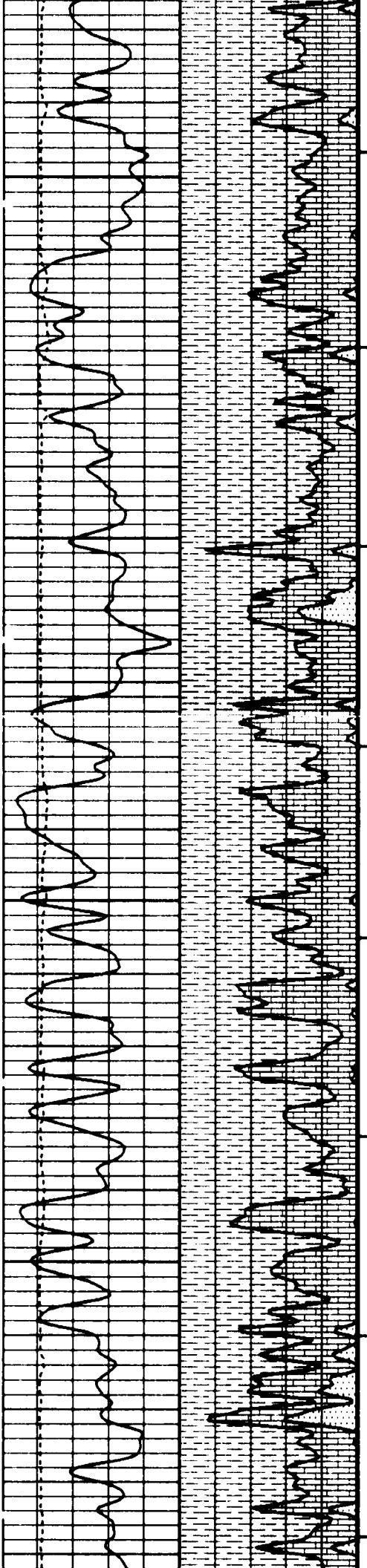


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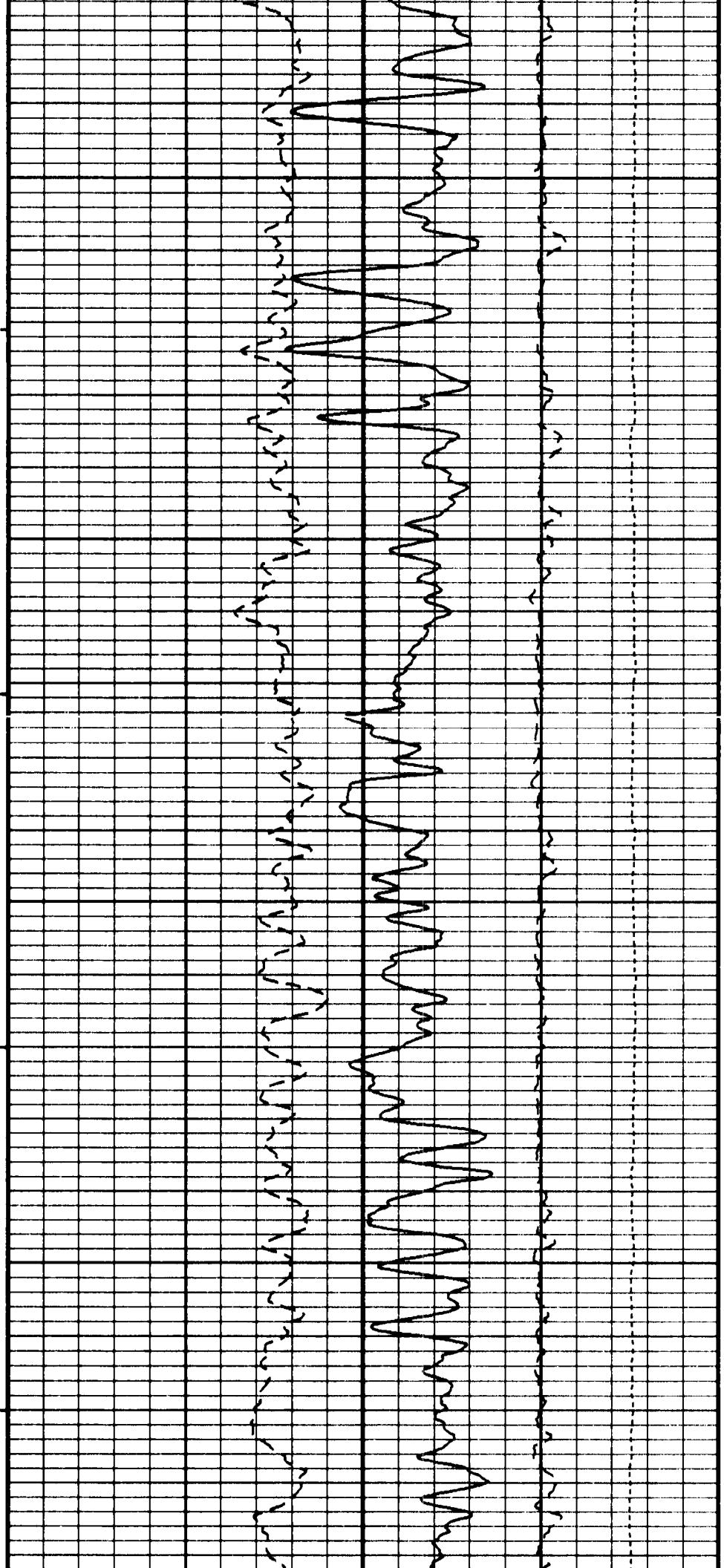


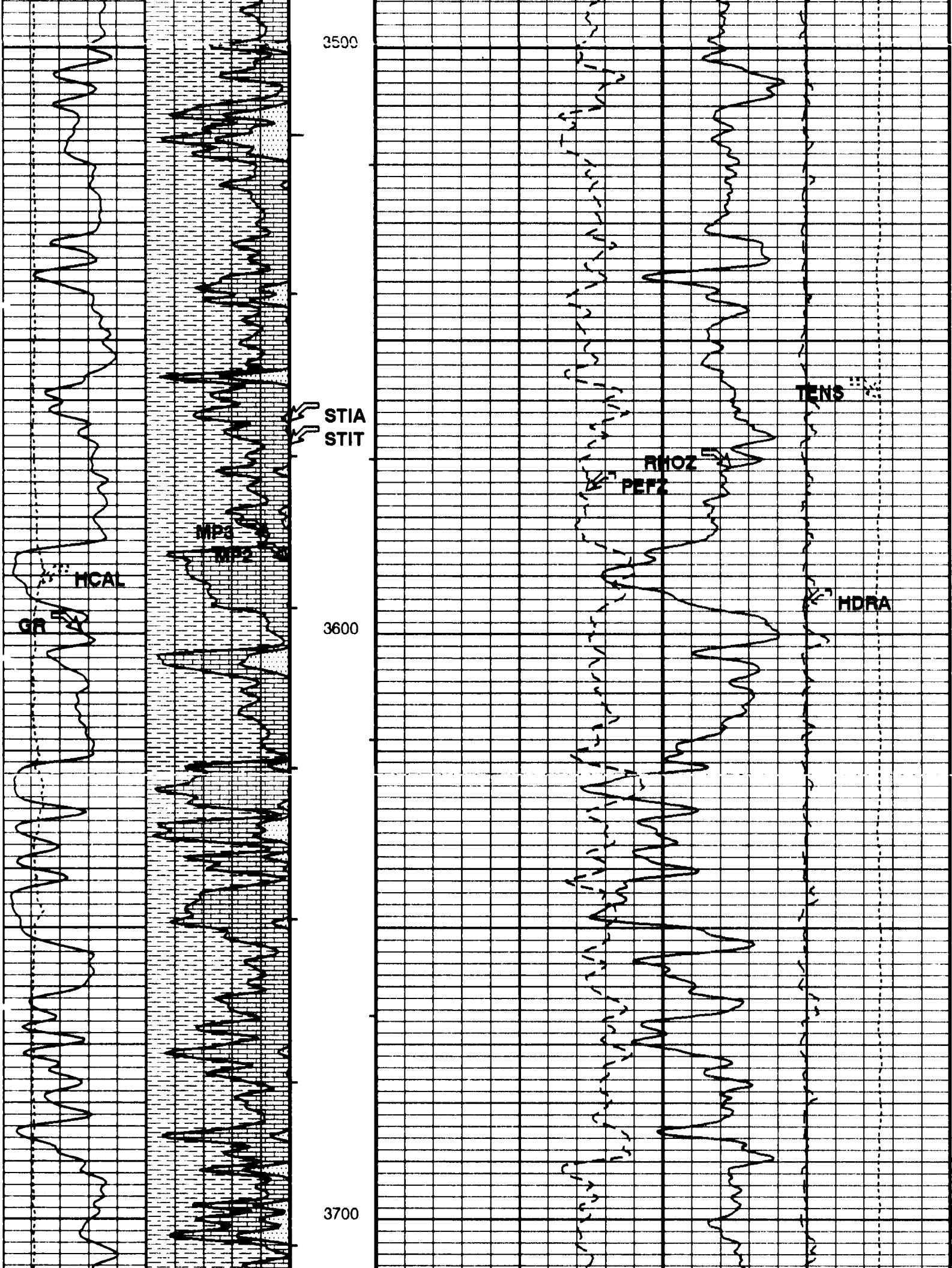


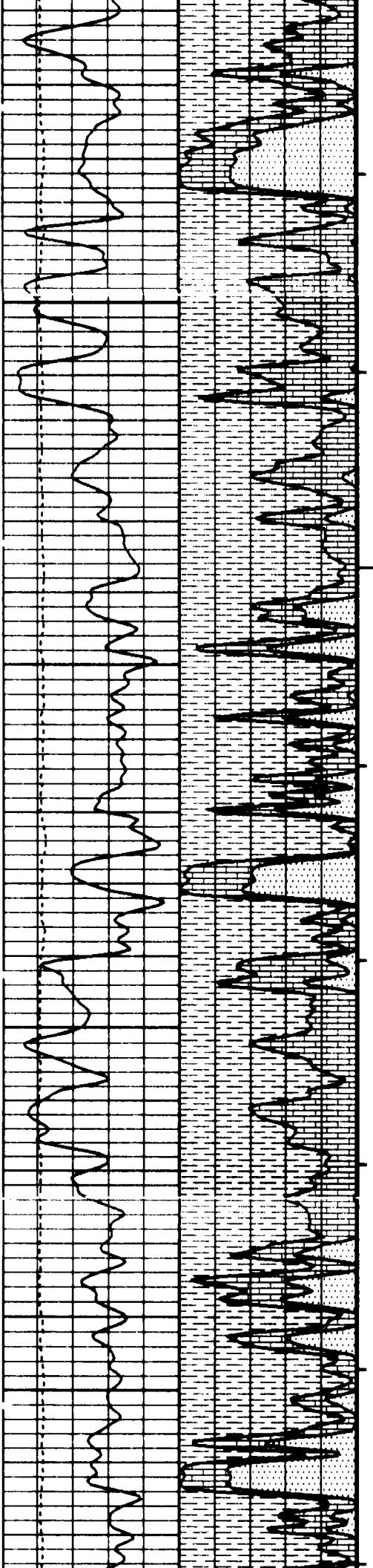


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3400

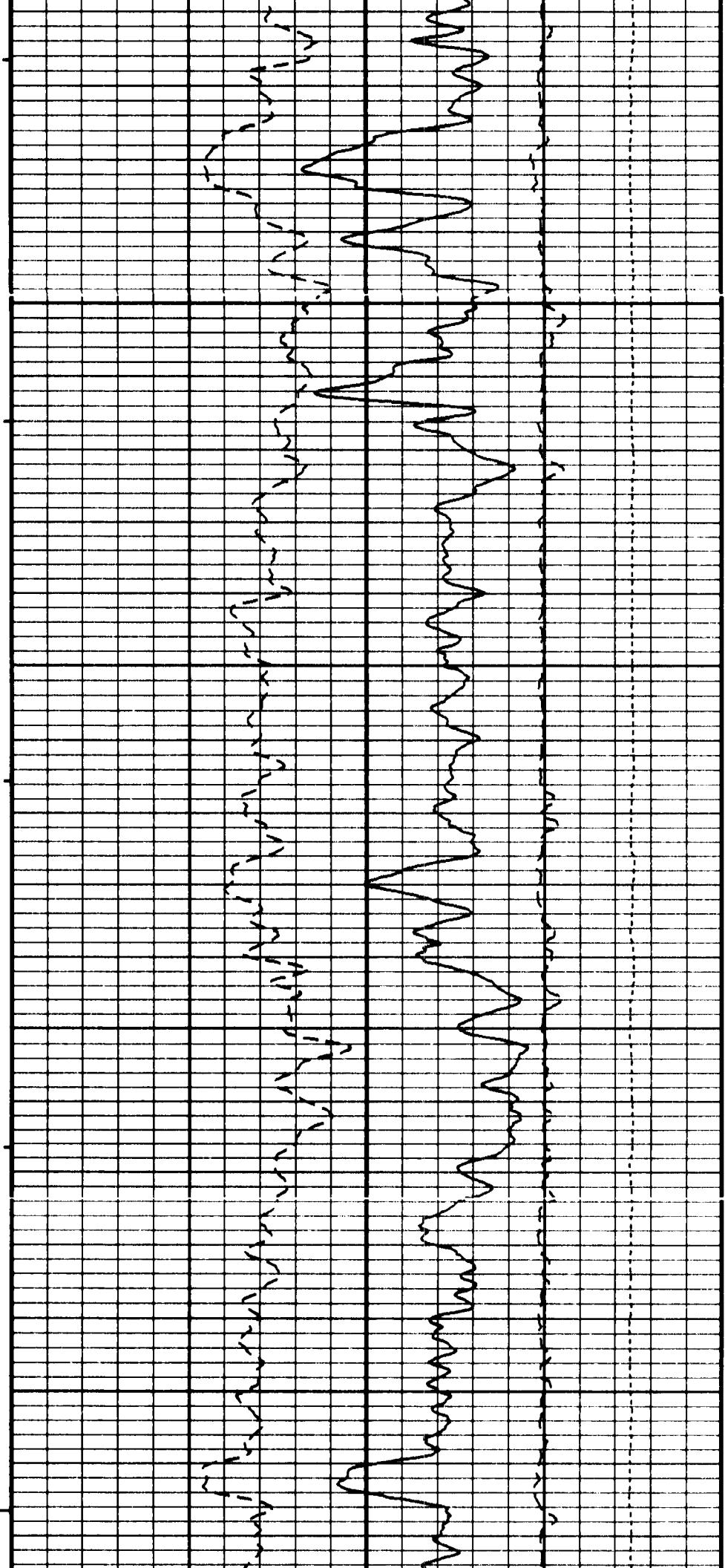






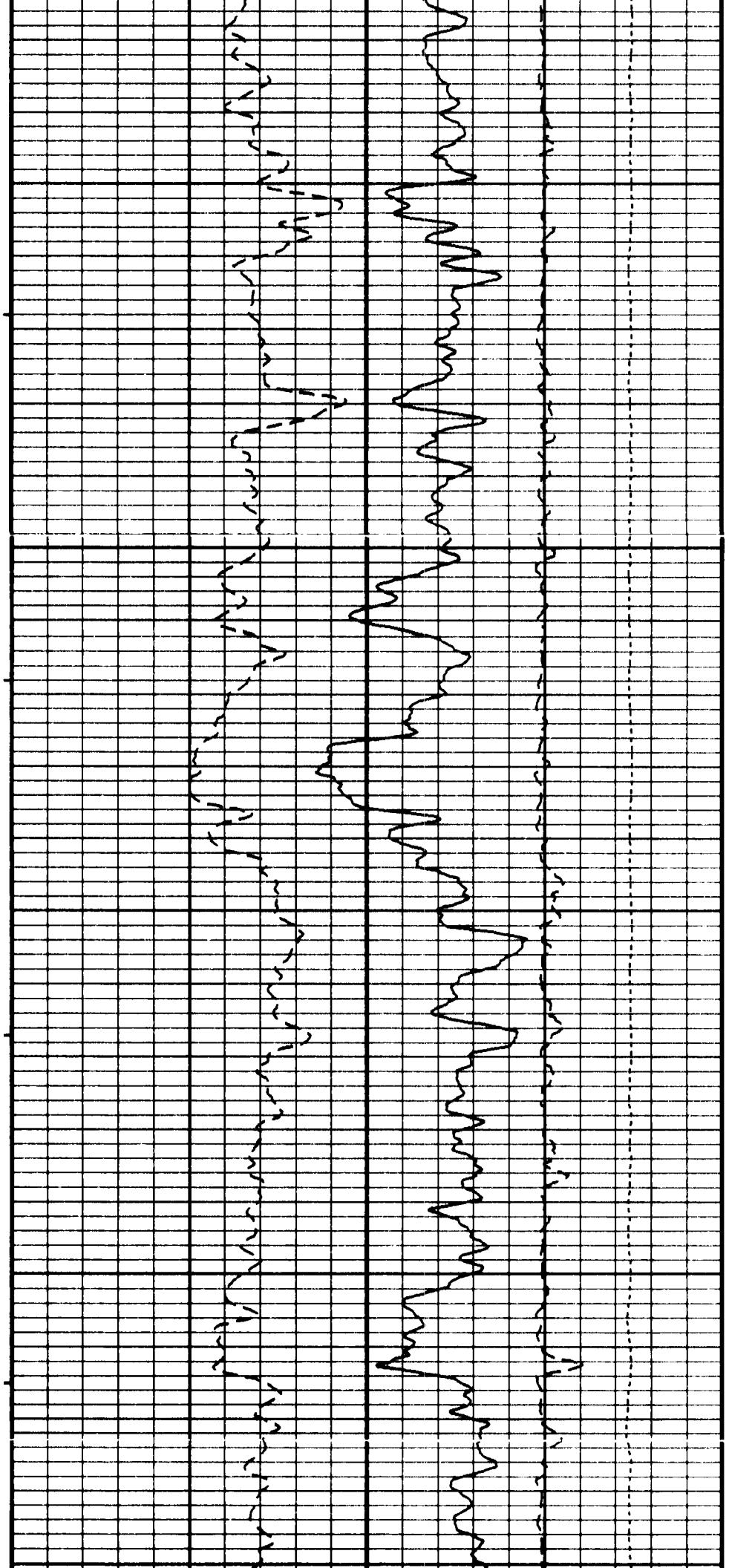
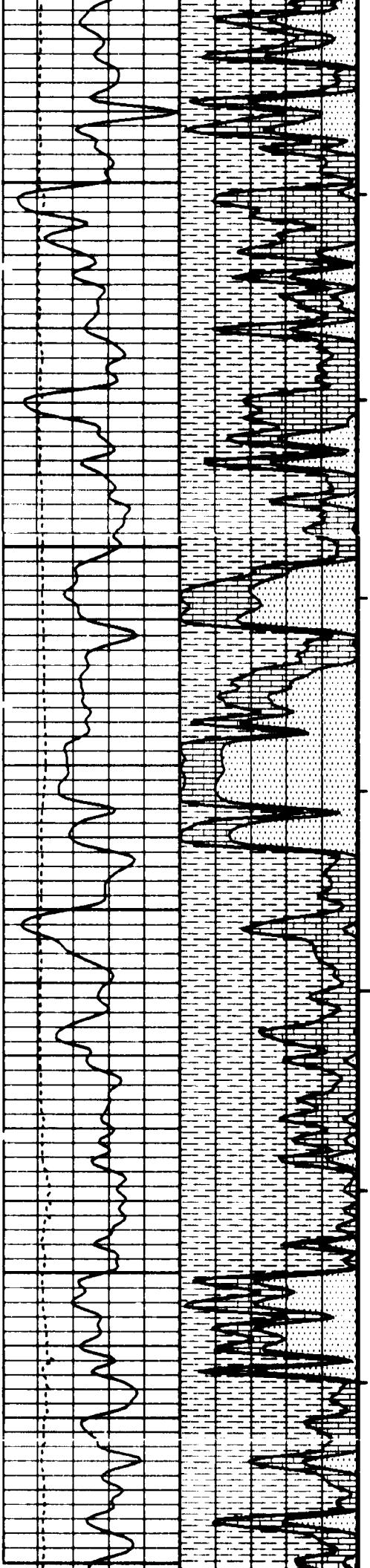
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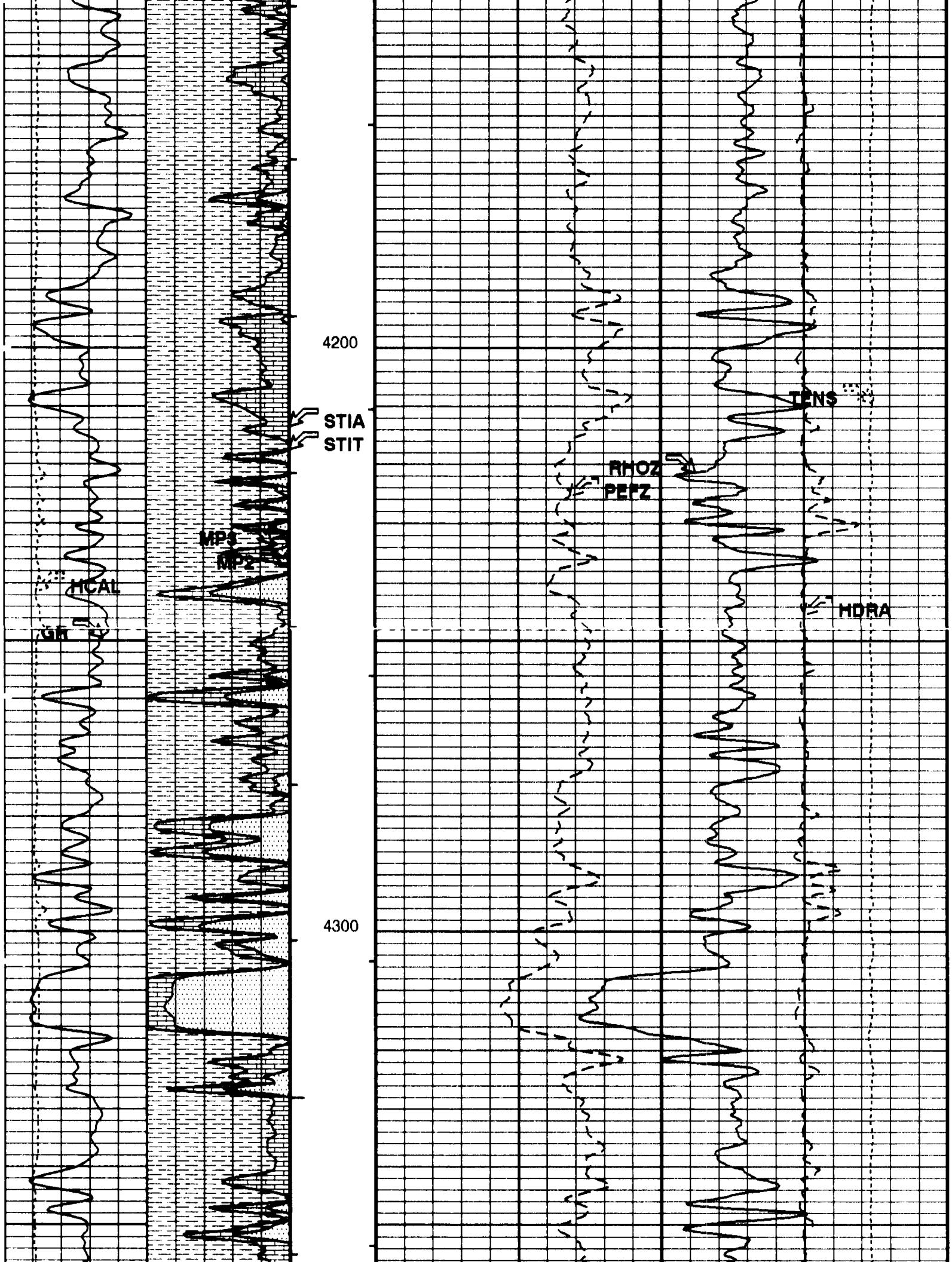
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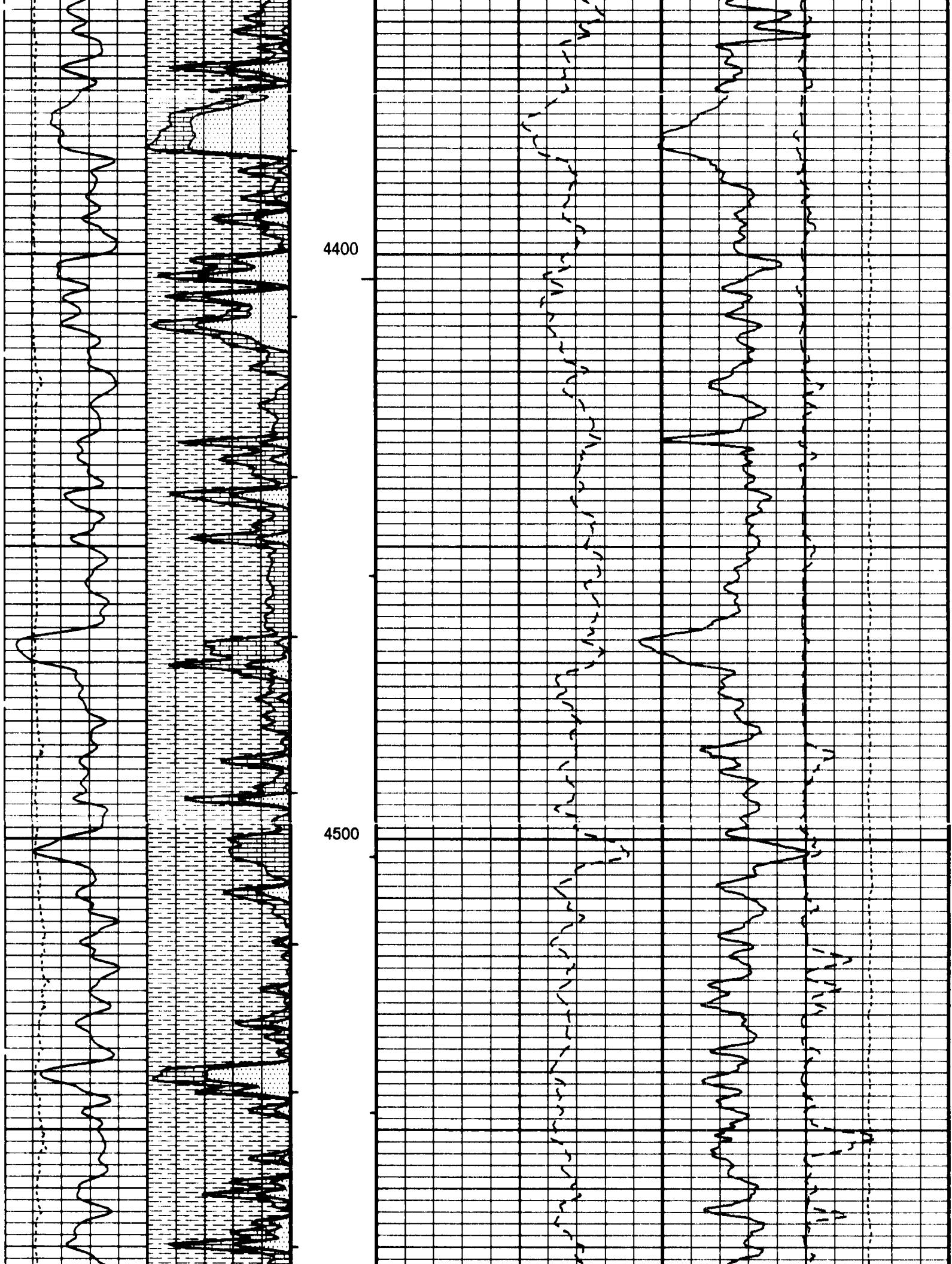


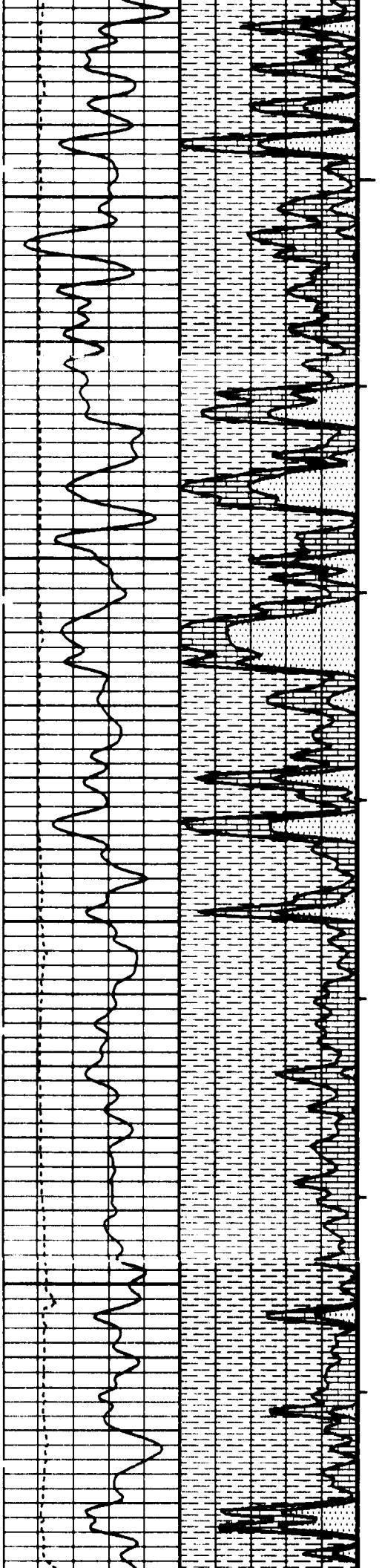
4000

4100



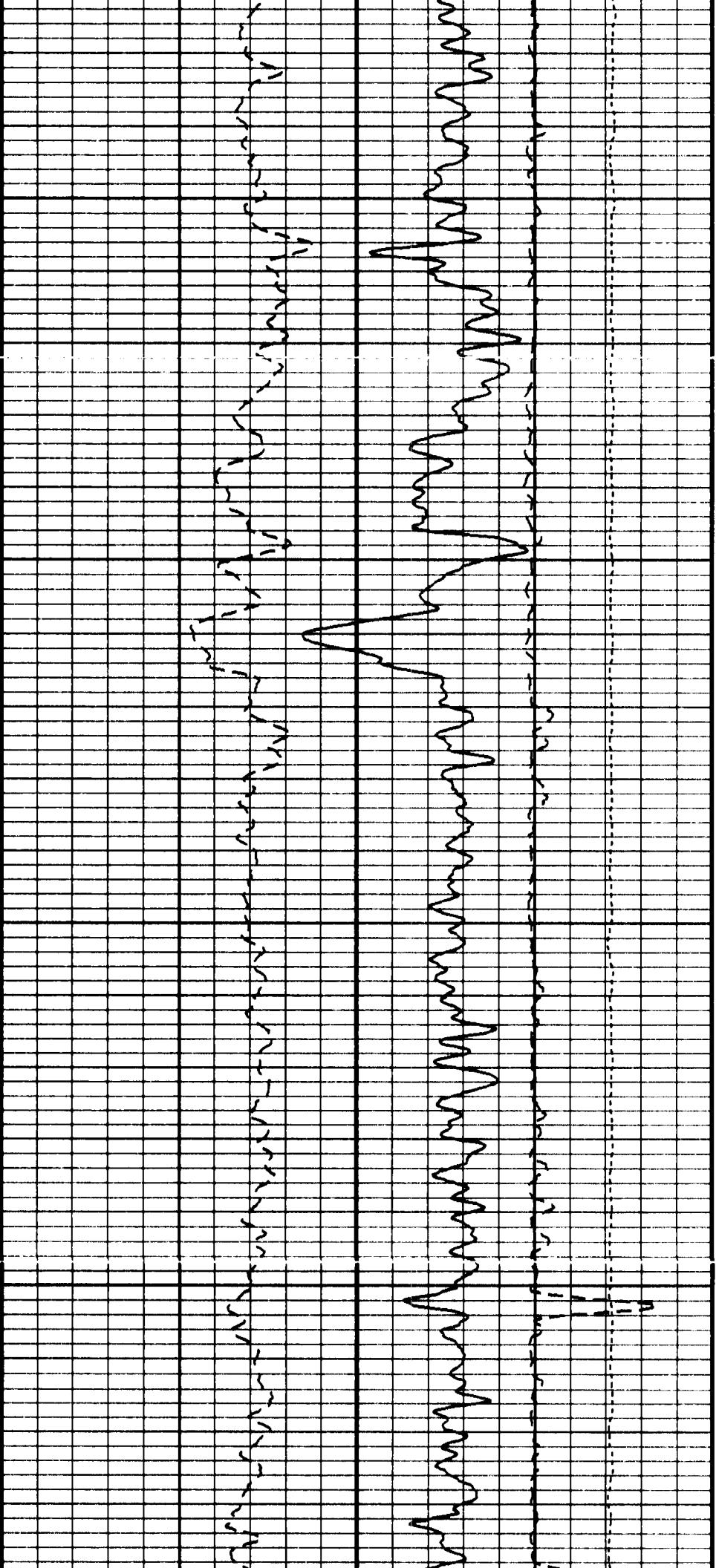


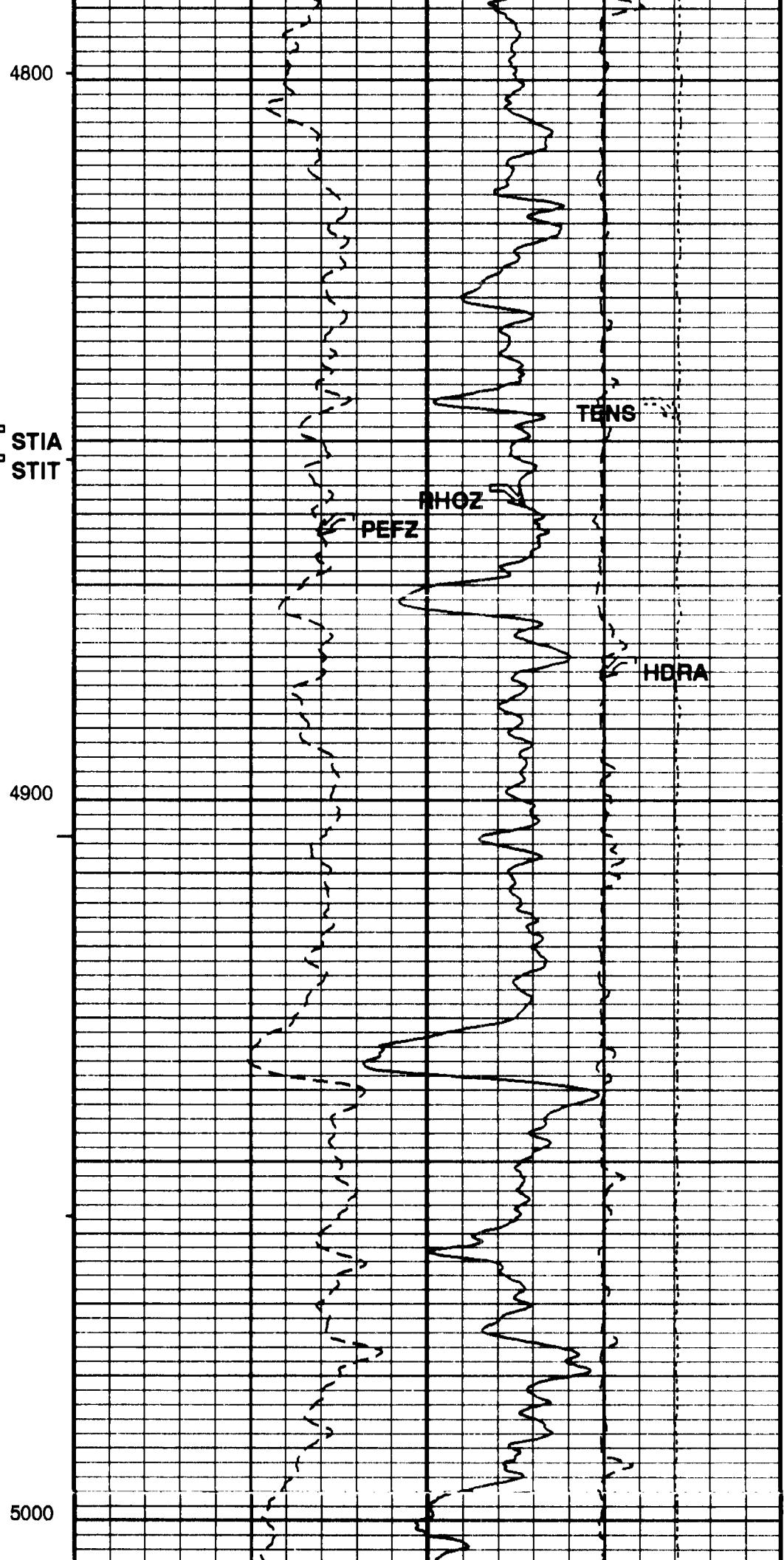
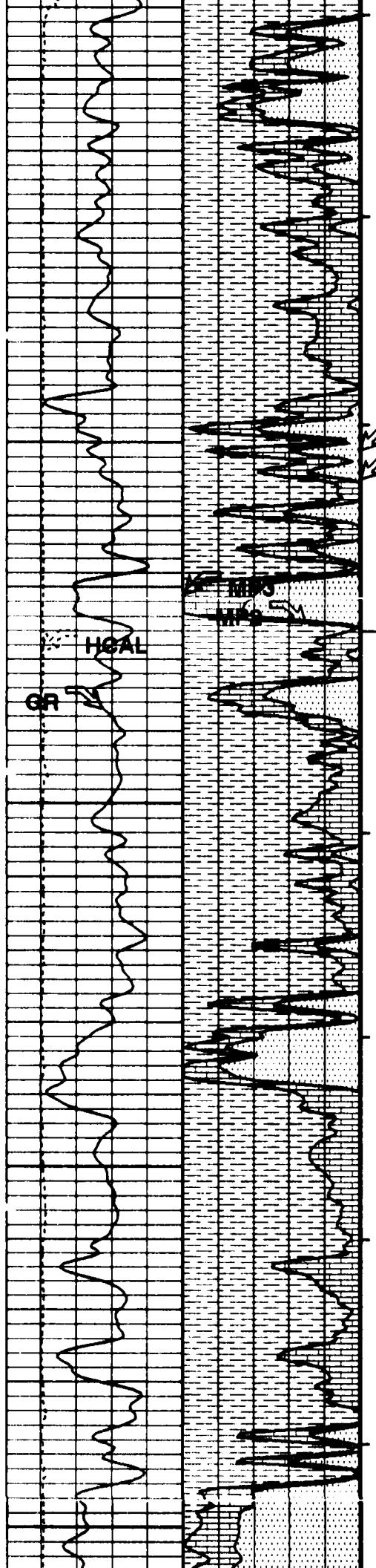


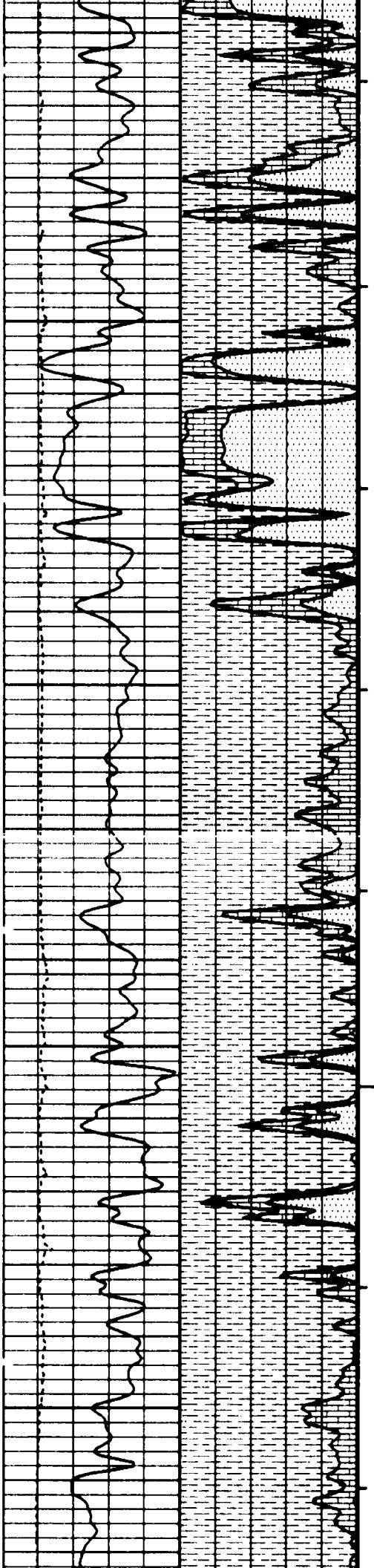


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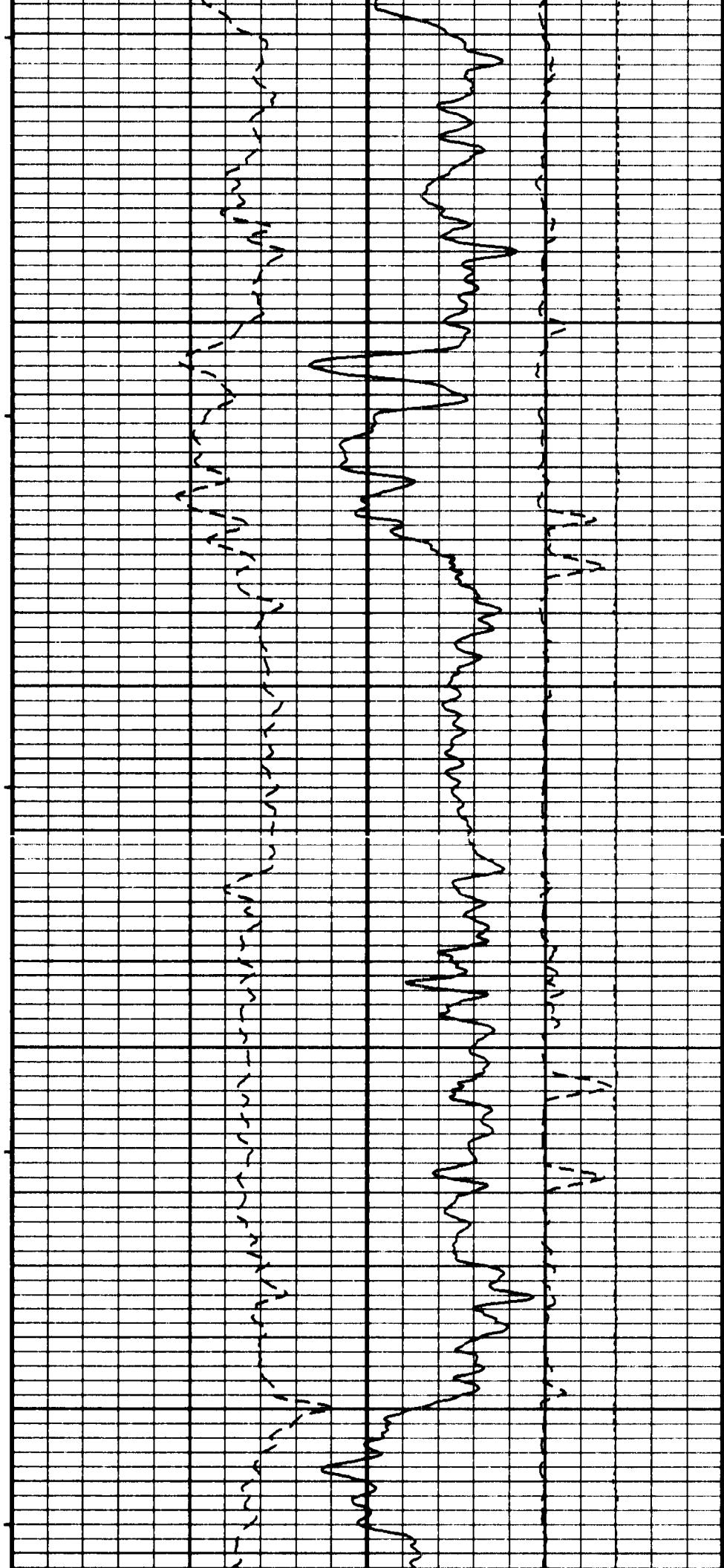


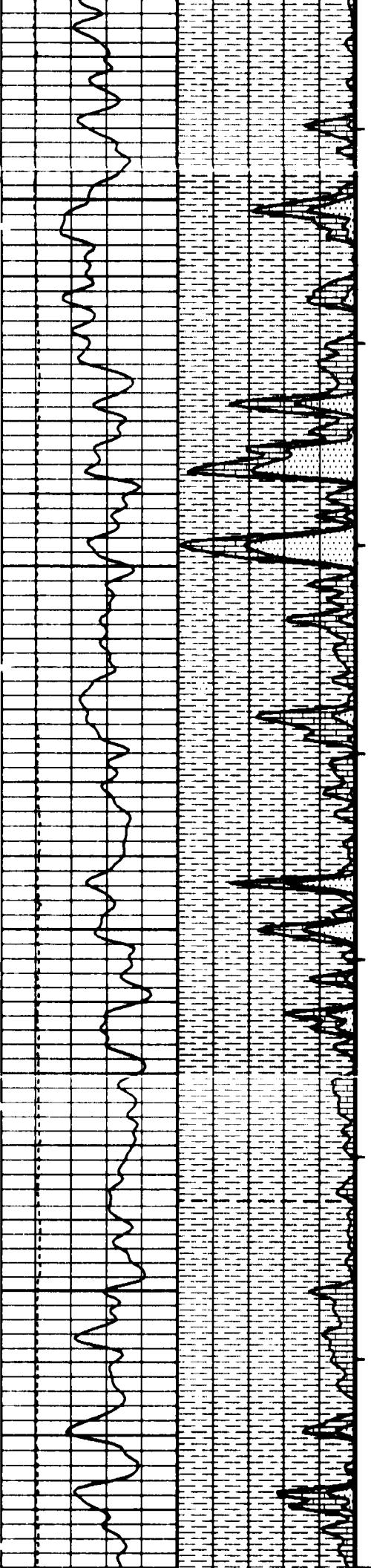




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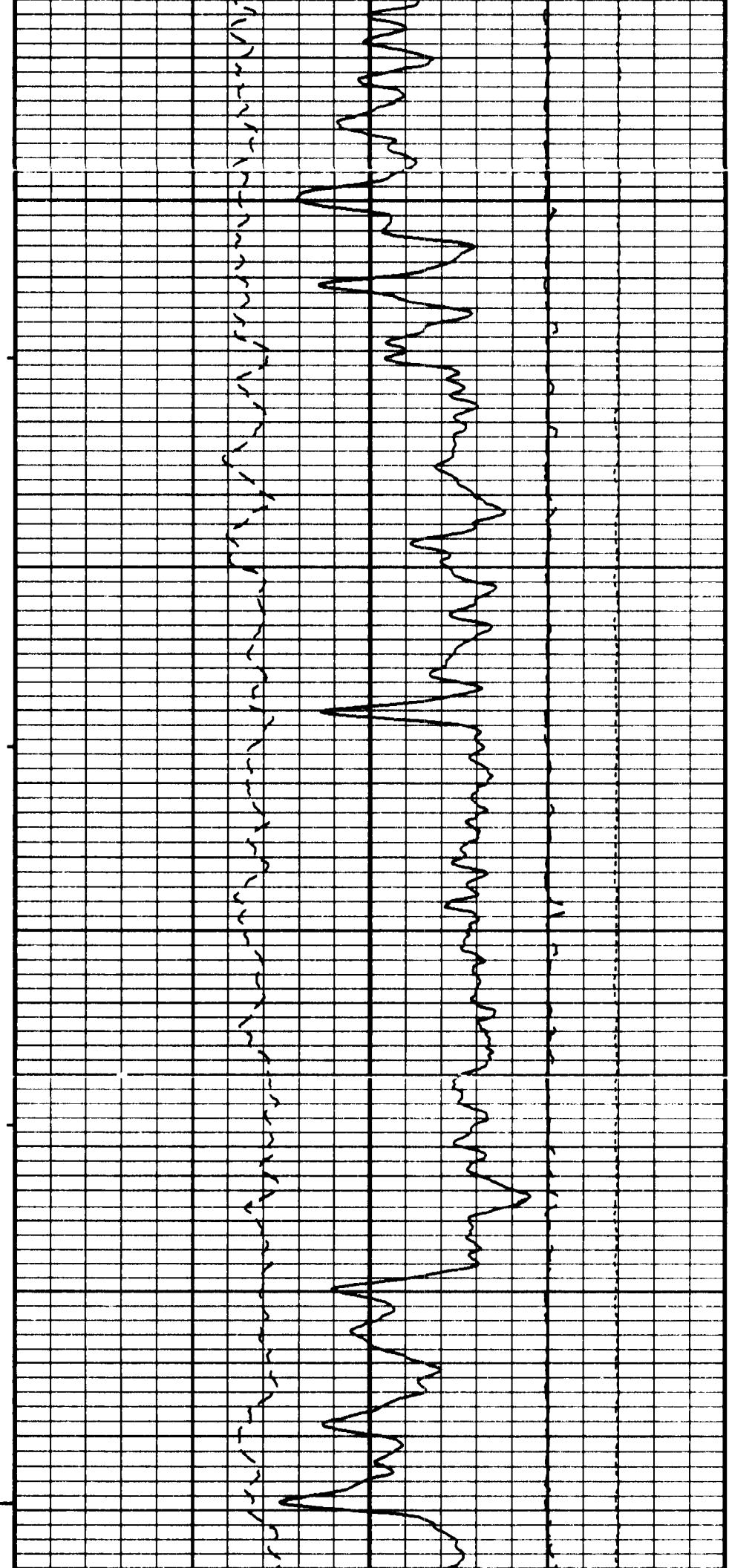
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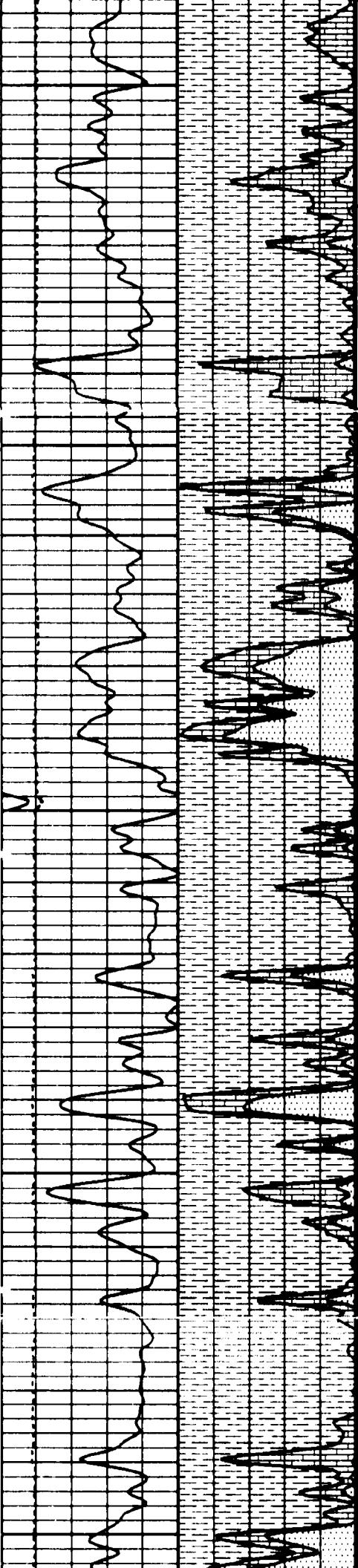




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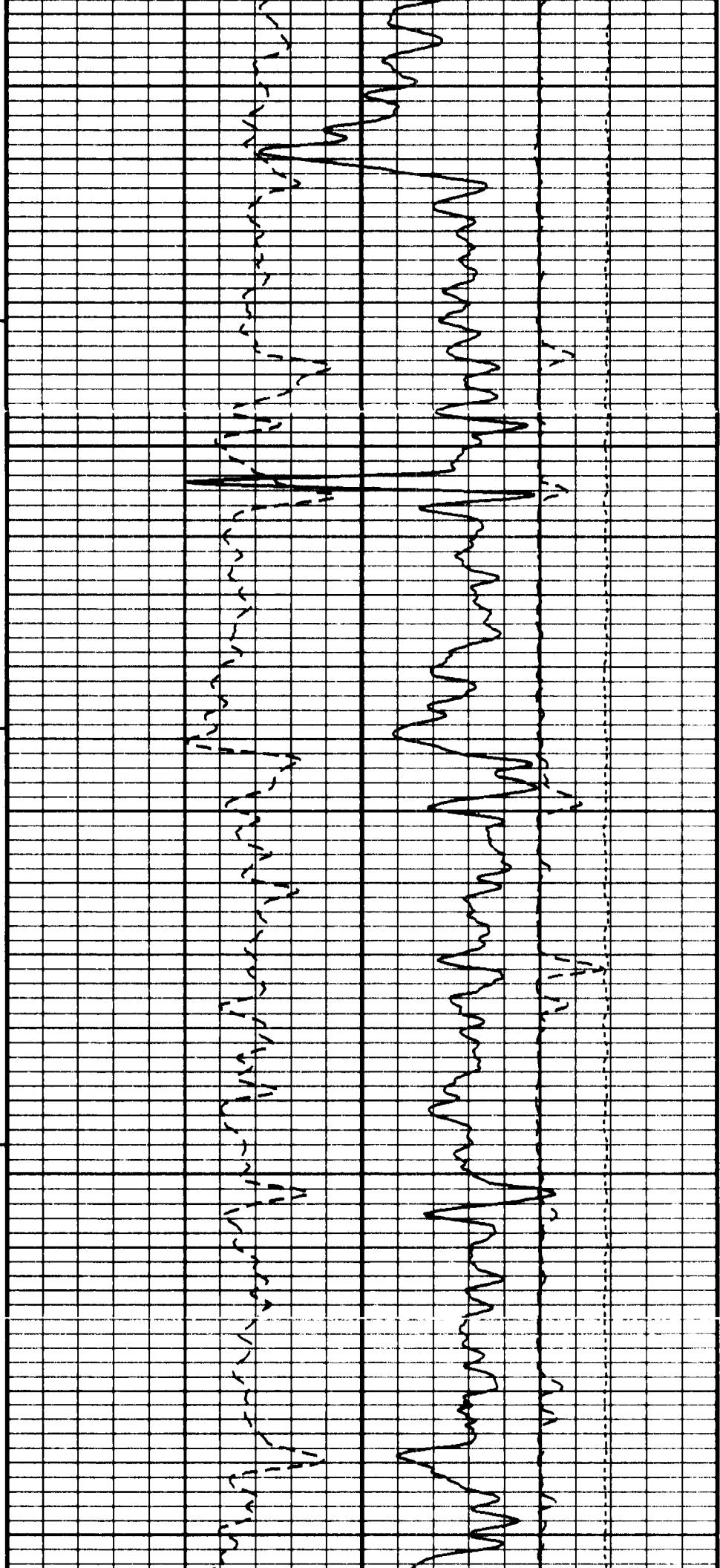
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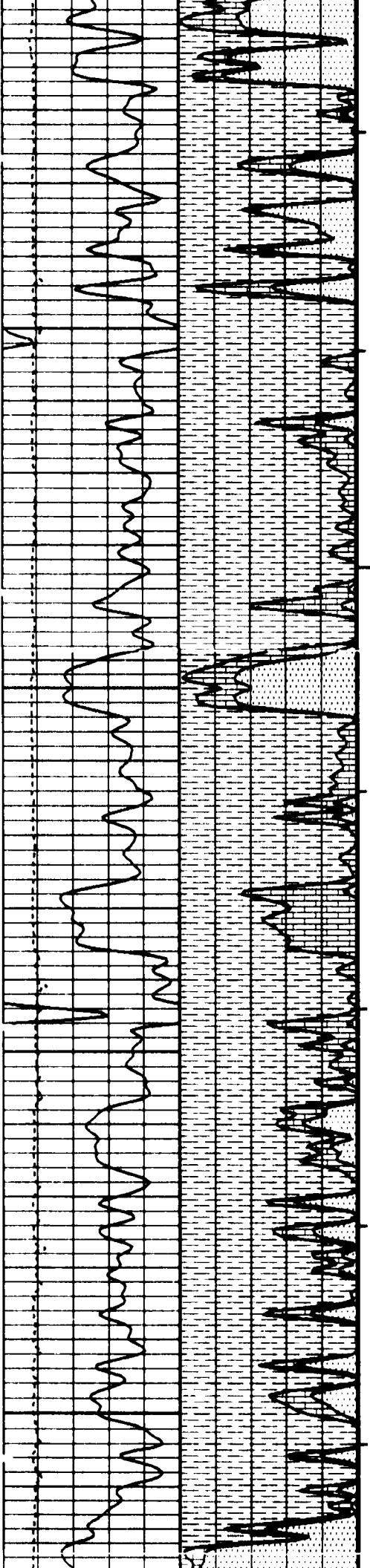




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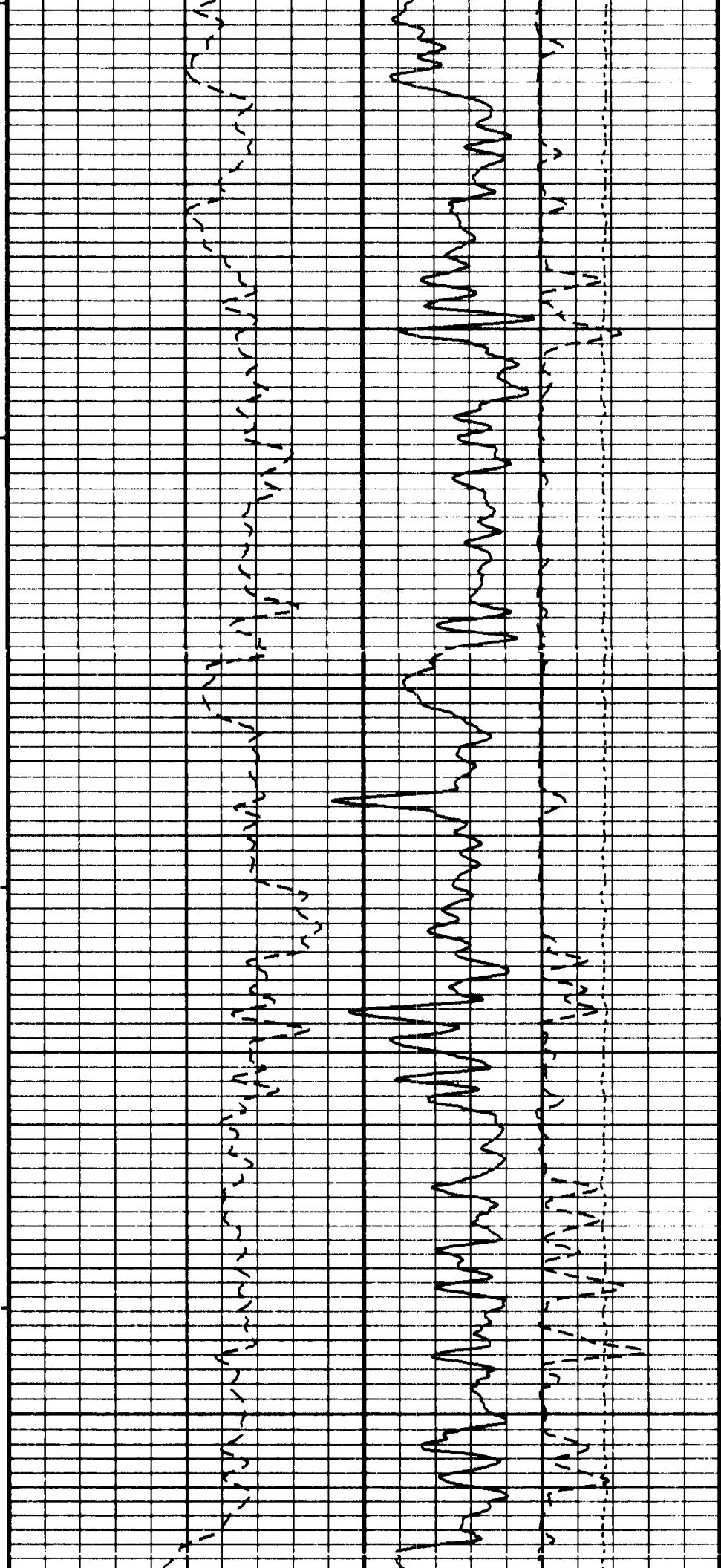
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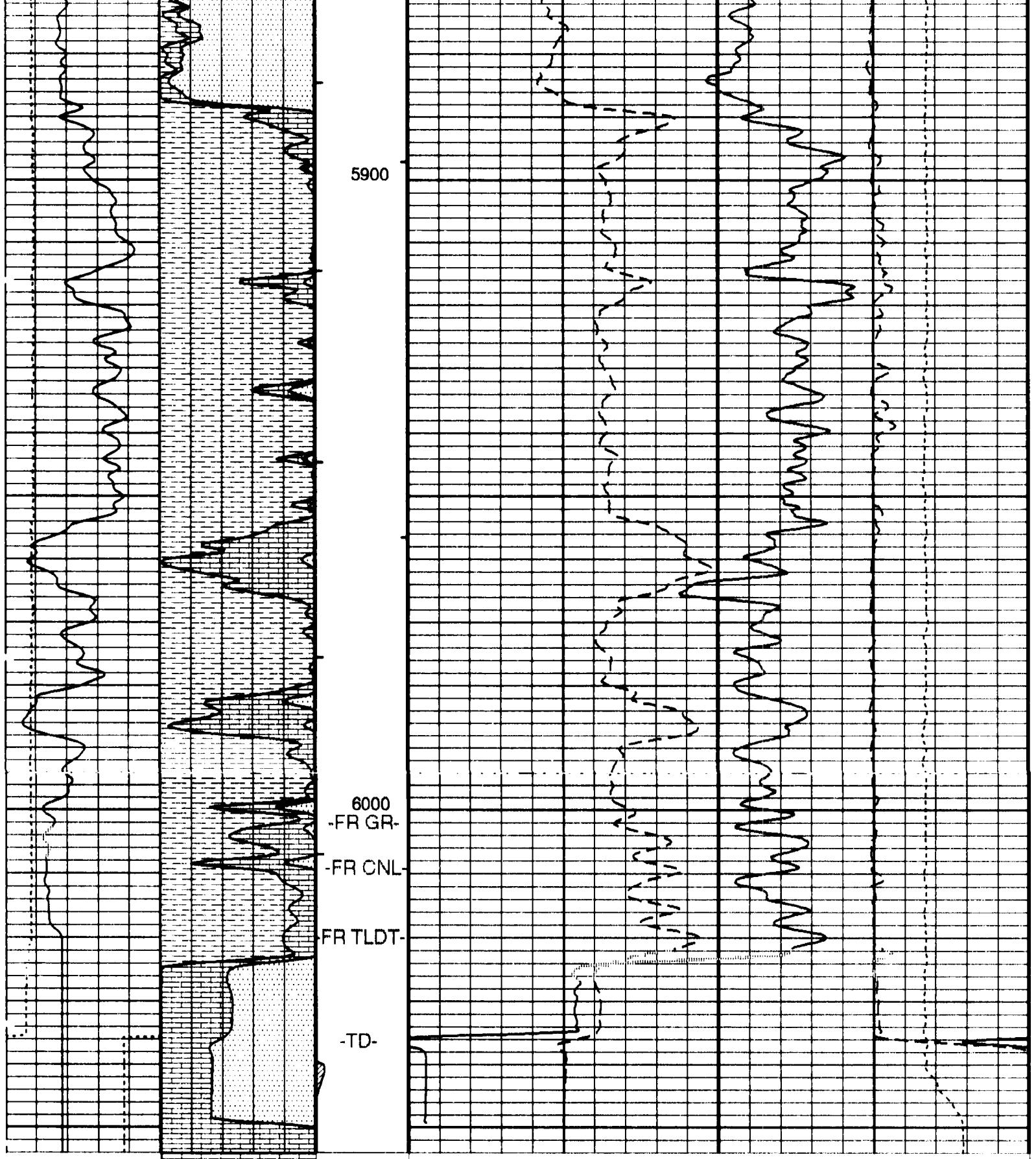




5700

5800





Gamma Ray (GR)
0 (GAPI) 200

Calcite
From MP3 to MP2

Stuck
Stretch
(STIT)
0 (F) 50

Std. Res. Formation Pe (PEFZ)
0 (---) 10

Caliper (HCAL)
6 (IN) 18

Quartz
From MP2 to
RHT1

Tool/Tot.
Drag
From D3T
to STIA
2

Std. Res. Formation Density (RHOZ)
(G/C3) 3

Dolomite/Shale

Borehole Log No. 1000

MAIN PASS

SANDSTONE MATRIX: 2.68 G/CC

Tension (TENS)

10000 (LBF) 0

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - + Integrated Cement Volume Minor Pip Every 10 F3
 - + Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
BDPS	Bulk Density Processing Selector	RHOB
BHT	Bottom Hole Temperature (used in calculations)	140 DEGF
BS	Bit Size	7.875 IN
CLIM	Caliper Limit for Bad Hole	999 IN
CNPS	Corrected Neutron Porosity Selector	NPOR
DFD	Drilling Fluid Density	8.30 LB/G
DHC	Density Hole Correction	BS
DRUL	DRHO Upper Limit	999 G/C3
FCAL	Caliper Presence Flag	PRESENT
FCGR	CGR Presence Flag	PRESENT
FD	Fluid Density	1 G/C3
FEXP	Form Factor Exponent	2
FLDT	LDT Presence Flag	PRESENT
FNUM	Form Factor Numerator	1
FSON	Sonic Presence Flag	ABSENT
GGRD	Geothermal Gradient	1.000000e-02 DF/F
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
HSCM	HILT Speed Correction Mode	NO_SC
HSTI	STI Uses HILT Acceleration	NO
MATR	Rock Matrix Type	SANDSTONE
NMT	HILT Nuclear Mud Type	NOBARITE
NPRM	HRDD Processing Mode	StdRes
NSAR	HRDD Depth Sampling Rate	1 IN
PMAX	PHI Maximum	50 PU
POUT	Porosity Output Lithology	SANDSTONE
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71 G/C3
RG22	RHO Grain (2-Mineral Model, Min-2)	2.68 G/C3
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877 G/C3
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71 G/C3
RG32	RHO Grain (3-Mineral Model, Min-2)	2.68 G/C3
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877 G/C3
RMFS	Resistivity of Mud Filtrate Sample	4.2900 OHMM
RTLF	RT Limit Flag	NO LIMIT
RWF	Resistivity of Free Water	2.000000e-02 OHMM
SHT	Surface Hole Temperature	68 DEGF
STKT	STI Stuck Threshold	4 FT
TD	Total Depth	6063 FT
TWS	Temperature of Connate Water Sample	100.00 DEGF
UF	U Fluid	0.398 B/C3
UM21	U Matrix (2-Mineral Model, Min-1)	13.77 B/C3
UM22	U Matrix (2-Mineral Model, Min-2)	5.5 B/C3
UM23	U Matrix (2-Mineral Model, Min-3)	8.997 B/C3
UM31	U Matrix (3-Mineral Model, Min-1)	13.77 B/C3
UM32	U Matrix (3-Mineral Model, Min-2)	5.5 B/C3
UM33	U Matrix (3-Mineral Model, Min-3)	8.997 B/C3

Format: DENS_MIN Vertical Scale: 5" per 100'

Graphics File Created: 4-MAR-1998 15:11

OP System Version: 7C0-712
DBM

HILTB-CTS	RPCV-999	RWA	RPCV-999
HOLEV	RPCV-999		

Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11

Input DLIS Files

DEFAULT HILTC .006 FN:5 FIELD 4-MAR-1998 14:13 6060.0 FT 5667.5 FT

Output DLIS Files

DEFAULT HILTC .007 FN:7 FIELD 4-MAR-1998 14:36
POCI HILTC .007 FN:8 CUST 4-MAR-1998 14:36

Integrated Hole/Cement Volume Summary

Hole Volume = 122.57 F3

Cement Volume = 58.81 F3 (assuming 5.50 IN casing O.D.)

Computed from 8060.0 FT to 5727.0 FT using data channel(s) HCAL

OP System Version: 7C0-712

HILTB-CTS **RPCV-999**
HOLEY **RPCV-999**

EWA BPCEV-888

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
 - └ Integrated Hole Volume Major Pip Every 100 F3
 - └ Integrated Cement Volume Minor Pip Every 10 F3
 - └ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Dolomite/Shale
From RHT1 to
MP3 REP

Quartz From MP2_REPO to RHT1

Calcite From MP3 REP to MP2 REP

**HCAL REP Curve
(HCAL REP)**

6 (IN) 16 0 (NM) 1

25 DECS

GR_n REP Curve (GR_n, REP)

REPEAT ANALYSIS

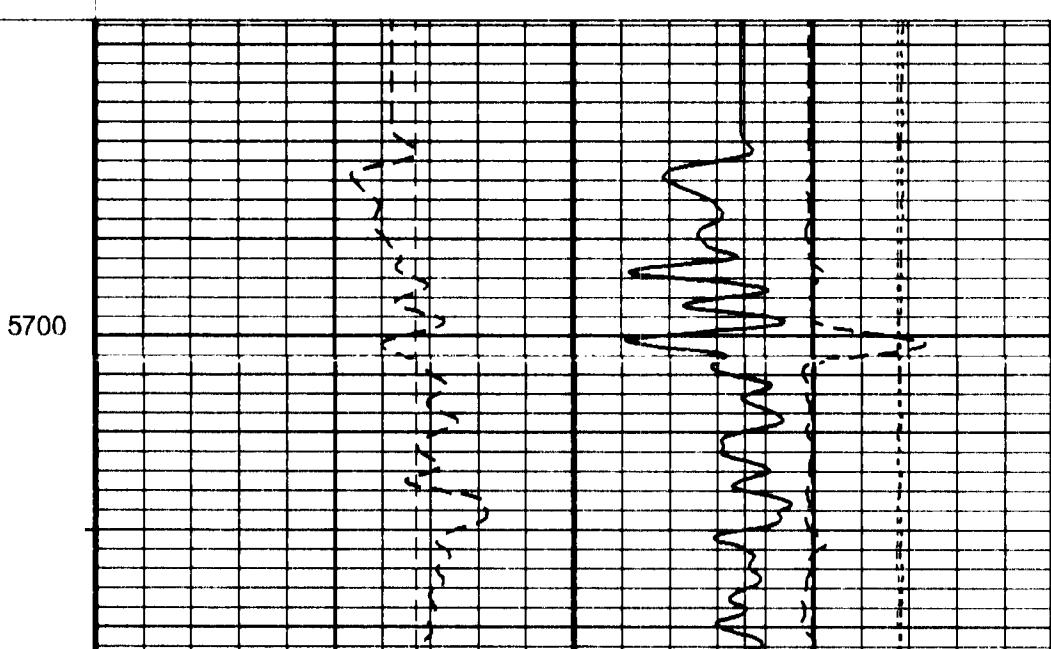
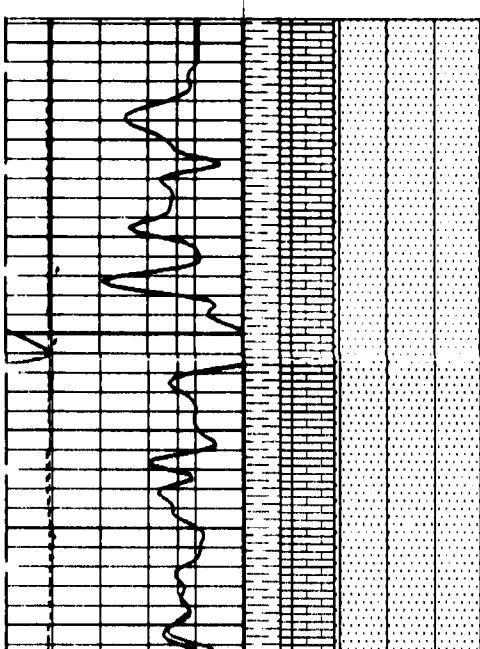
SANDSTONE MATRIX 2.93 G/CC

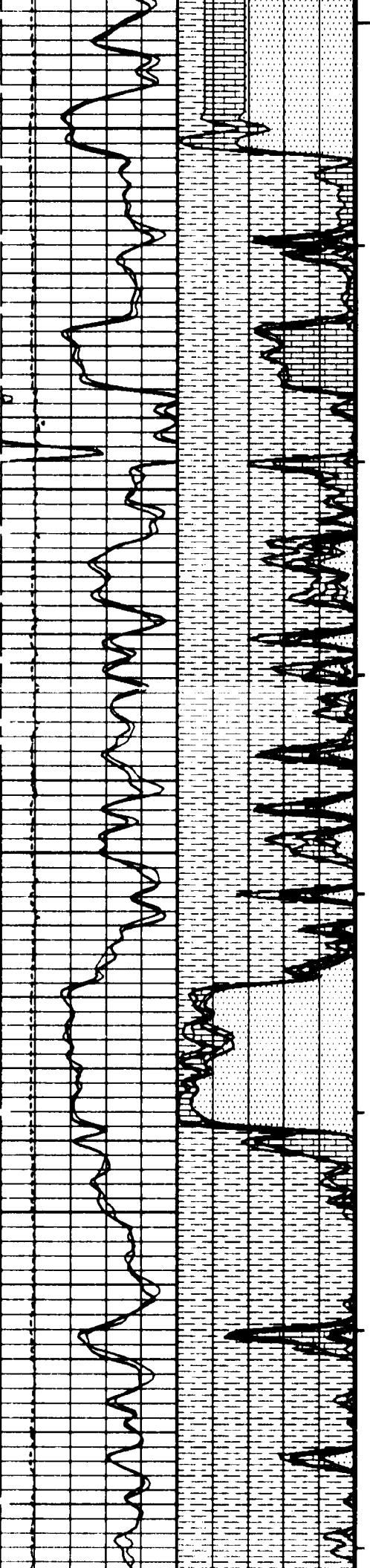
TENS REP Curve (TENS REP)

HDRA REP Curve (HDRA REP)

RHOZ REP Curve (RHOZ REP) (G/C3)

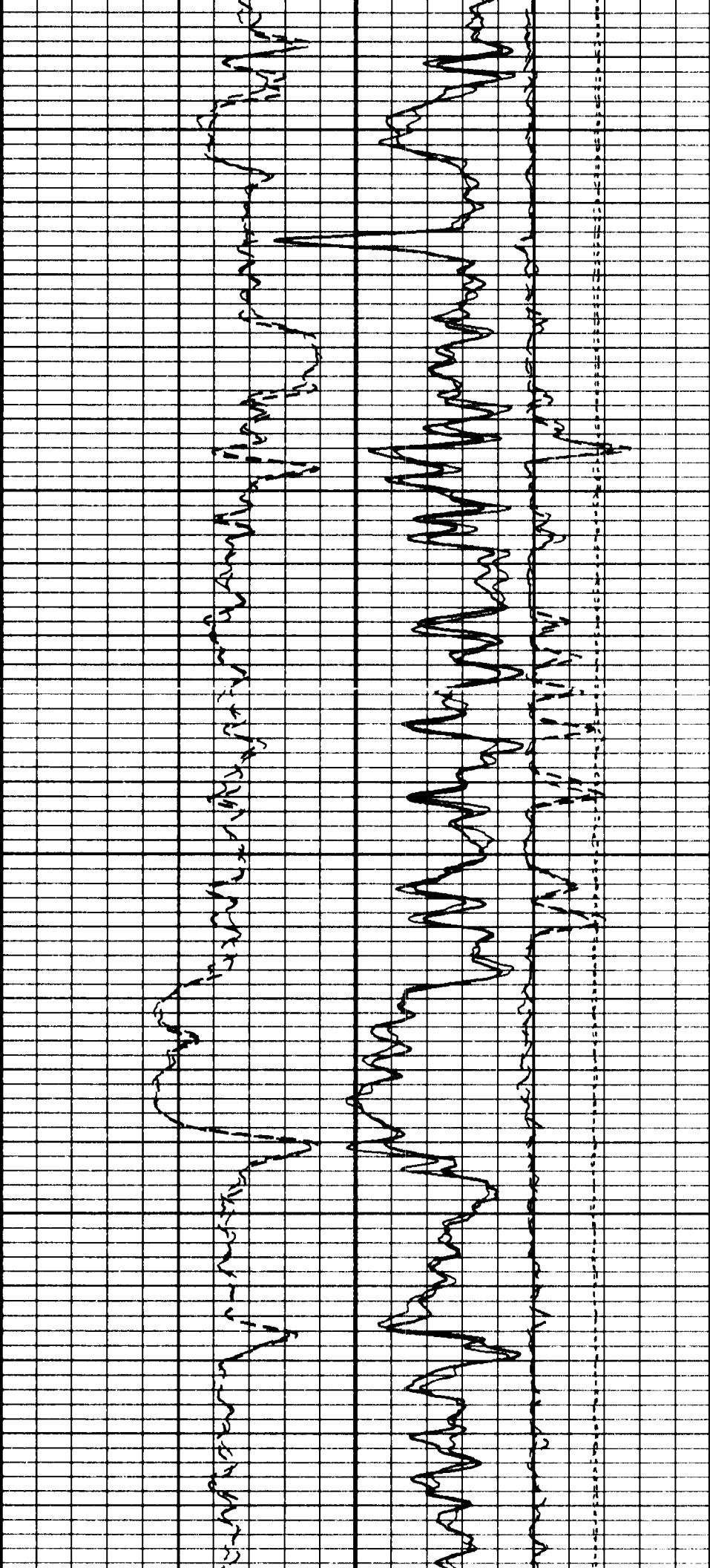
PEFZ REP Curve (PEFZ REP)

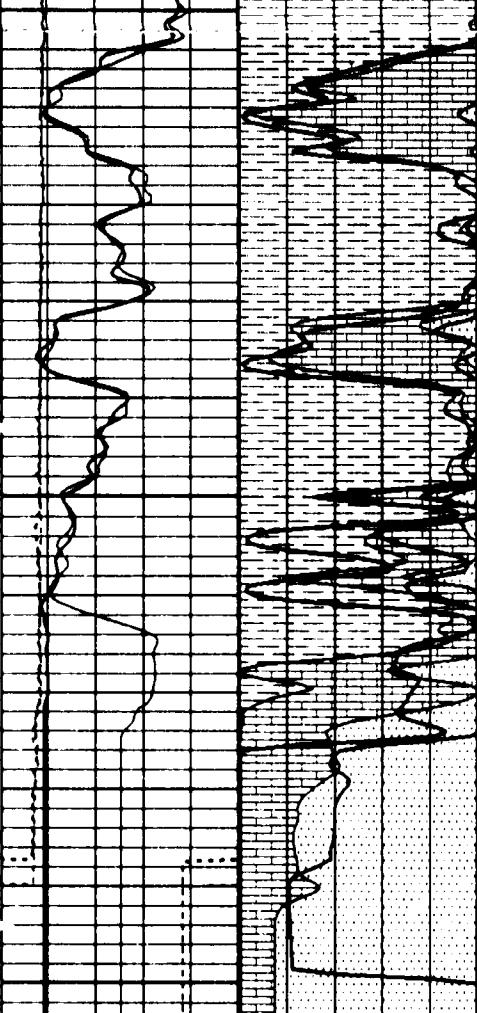




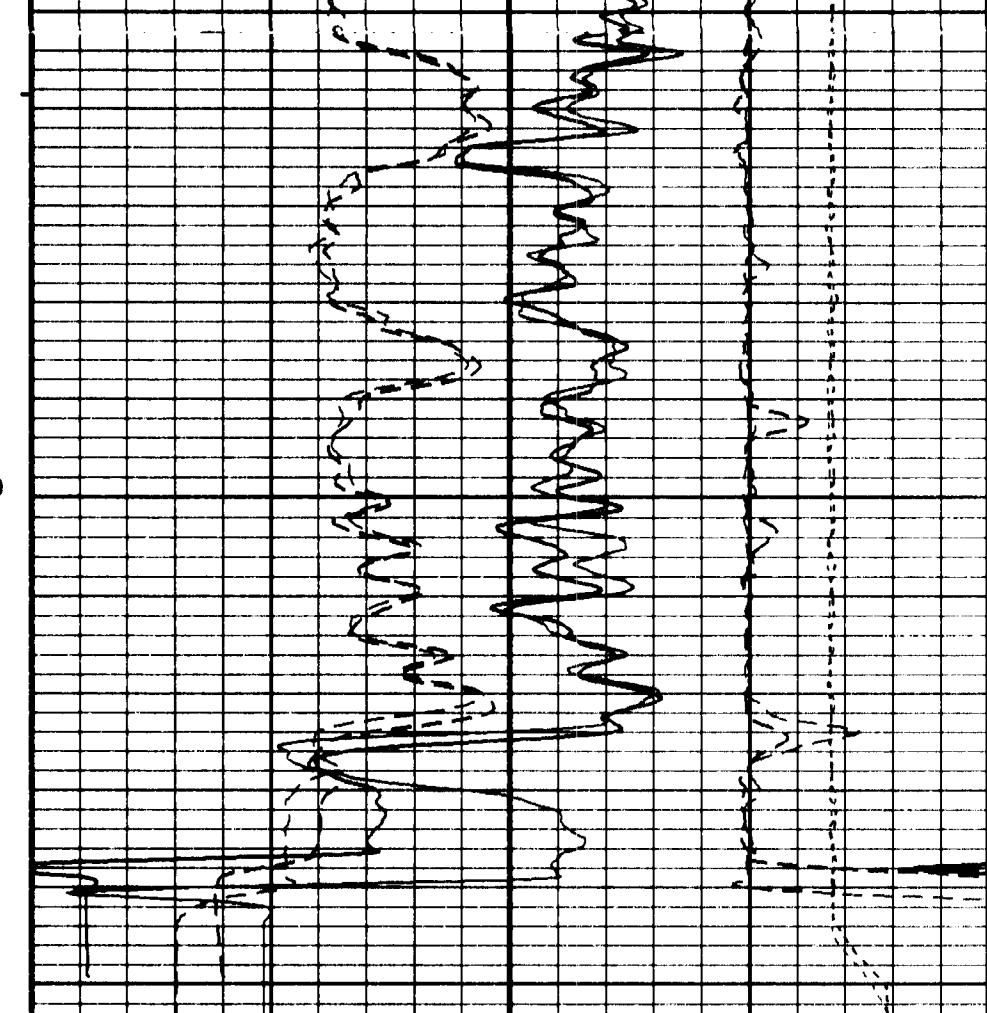
5800

5900





GR REP Curve (GR REP)	MP2 REP Curve (MP2 REP)
0 (GAPI)	200 1 (V/V) 0
HCAL REP Curve (HCAL REP)	MP3 REP Curve (MP3 REP)
6 (IN)	16 0 (V/V) 1
Calcite From MP3 REP to MP2 REP	
Quartz From MP2 REP to RHT1	
Dolomite/Shale From RHT1 to MP3 REP	



PEFZ REP Curve (PEFZ REP)	RHOZ REP Curve (RHOZ REP)	HDRA REP Curve (HDRA REP)	TENS REP Curve (TENS REP)
0 (---)	2 (G/C3) 3	-0.25 (G/C3) 0.25	10000 (LBF) 0
REPEAT ANALYSIS			
SANDSTONE MATRIX: 2.66 G/CC			

PIP SUMMARY

- ─ Integrated Hole Volume Minor Pip Every 10 F3
- ─ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name

Description

Value

BDPS

RHOB

DEGF

BHT

140

IN

BS

7.875

IN

CLIM

999

IN

CNPS

NPOR

L/B/C

DED

8.30

DFD	Drilling Fluid Density	8.30	LB/G
DHC	Density Hole Correction	BS	
DORL	Depth Offset Repeat Analysis	0.0	FT
DRUL	DRHO Upper Limit	999	G/C3
FCAL	Caliper Presence Flag	PRESENT	
FCGR	CGR Presence Flag	PRESENT	
FD	Fluid Density	1	G/C3
FEXP	Form Factor Exponent	2	
FLDT	LDT Presence Flag	PRESENT	
FNUM	Form Factor Numerator	1	
FSON	Sonic Presence Flag	ABSENT	
GGRD	Geothermal Gradient	1.000000e-02	DF/F
GTSE	Generalized Temperature Selection	LINEAR ESTIMATE	
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION	
HSTI	STI Uses HILT Acceleration	YES	
MATR	Rock Matrix Type	SANDSTONE	
NMT	HILT Nuclear Mud Type	NOBARITE	
NPRM	HRDD Processing Mode	StdRes	
NSAR	HRDD Depth Sampling Rate	1	IN
PMAX	PHI Maximum	50	PU
POUT	Porosity Output Lithology	SANDSTONE	
RG21	RHO Grain (2-Mineral Model, Min-1)	2.71	G/C3
RG22	RHO Grain (2-Mineral Model, Min-2)	2.68	G/C3
RG23	RHO Grain (2-Mineral Model, Min-3)	2.877	G/C3
RG31	RHO Grain (3-Mineral Model, Min-1)	2.71	G/C3
RG32	RHO Grain (3-Mineral Model, Min-2)	2.68	G/C3
RG33	RHO Grain (3-Mineral Model, Min-3)	2.877	G/C3
RMFS	Resistivity of Mud Filtrate Sample	4.2900	OHMM
RTLF	RT Limit Flag	NO LIMIT	
RWF	Resistivity of Free Water	2.000000e-02	OHMM
SHT	Surface Hole Temperature	68	DEGF
TD	Total Depth	6063	FT
TWS	Temperature of Connate Water Sample	100.00	DEGF
UF	U Fluid	0.398	B/C3
UM21	U Matrix (2-Mineral Model, Min-1)	13.77	B/C3
UM22	U Matrix (2-Mineral Model, Min-2)	5.5	B/C3
UM23	U Matrix (2-Mineral Model, Min-3)	8.997	B/C3
UM31	U Matrix (3-Mineral Model, Min-1)	13.77	B/C3
UM32	U Matrix (3-Mineral Model, Min-2)	5.5	B/C3
UM33	U Matrix (3-Mineral Model, Min-3)	8.997	B/C3

Format: DENS_MIN REP Vertical Scale: 5" per 100'

Graphics File Created: 4-MAR-1998 14:36

OP System Version: 7C0-712 DBM

HILTB-CTS	RPCV-999	RWA	RPCV-999
HOLEV	RPCV-999		

Input DLIS Files

DEFAULT	HILTC .006	FN:5	FIELD	4-MAR-1998 14:13	6060.0 FT	5667.5 FT
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Output DLIS Files

DEFAULT	HILTC .007	FN:7	FIELD	4-MAR-1998 14:36
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Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase							
Master: Mar 3 15:38 1998 Before: Mar 4 08:26 1998							
Thru Cal Magnitude - 0	0	0.6062	0.6063	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.243	1.243	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6177	0.6178	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.6984	0.6986	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.309	1.309	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.896	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.895	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.380	1.381	N/A	N/A	N/A	V
Phase - 0	0	51.07	51.11	N/A	N/A	N/A	DEG
Phase - 1	0	49.98	50.02	N/A	N/A	N/A	DEG
Phase - 2	0	46.22	46.26	N/A	N/A	N/A	DEG
Phase - 3	0	45.44	45.49	N/A	N/A	N/A	DEG
Phase - 4	0	39.08	39.14	N/A	N/A	N/A	DEG

Phase - 5	0	37.22	37.28	N/A	N/A	N/A	DEG
Phase - 6	0	37.21	37.27	N/A	N/A	N/A	DEG
Phase - 7	0	33.39	33.51	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxiliary

Master: Mar 3 15:38 1998 Before: Mar 4 08:26 1998

AIT-H SPA Plus	990.5	992.8	992.9	N/A	N/A	N/A	MV
AIT-H SPA Zero	0	0.3998	0.3963	N/A	N/A	N/A	MV
AIT-H Temperature Plus	0.9150	0.9197	0.9198	N/A	N/A	N/A	V
AIT-H Temperature Zero	0	0.0004027	0.0004047	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction

Master: Mar 3 15:38 1998

Test Loop Gain Magnitude - 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9914	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9925	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.016	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.3987	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.5347	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.2321	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	-0.1539	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.3521	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.2901	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.1364	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.2994	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction

Master: Mar 3 15:38 1998

R Sonde Error Correction - 0	0	-93.88	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	161.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	107.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	64.57	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	25.88	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	14.54	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.814	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.6669	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	5.647	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-43.27	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	-133.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	83.37	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-8.148	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	-9.012	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	5.059	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	9.732	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction

Master: Mar 3 15:38 1998

Coarse - Mag, Real, Imag - 0	0	1.099	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 1	0	1.099	N/A	N/A	N/A	N/A	
Coarse - Mag, Real, Imag - 2	0	1.099	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 0	0	1.097	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 1	0	1.097	N/A	N/A	N/A	N/A	
Fine - Mag, Real, Imag - 2	0	1.097	N/A	N/A	N/A	N/A	

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary

Before: Mar 4 08:29 1998

BS Window Ratio	1.004	N/A	1.005	N/A	N/A	N/A	
BS Window Sum	15360	N/A	15350	N/A	N/A	N/A	CPS
SS Window Ratio	0.4867	N/A	0.4873	N/A	N/A	N/A	
SS Window Sum	12830	N/A	12810	N/A	N/A	N/A	CPS
LS Window Ratio	0.3026	N/A	0.3009	N/A	N/A	N/A	
LS Window Sum	1518	N/A	1506	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations

Before: Mar 4 08:29 1998

BS PM High Voltage (Command)	1498	N/A	1514	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1666	N/A	1663	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1811	N/A	1801	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration

Before: Mar 4 08:29 1998

BS Crystal Resolution	12.13	N/A	12.40	N/A	N/A	N/A	%
SS Crystal Resolution	10.18	N/A	10.15	N/A	N/A	N/A	%
LS Crystal Resolution	9.332	N/A	9.389	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration

Before: Mar 4 08:34 1998							
Raw B0 Resistivity	3875	N/A	3835	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3822	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3814	N/A	N/A	N/A	OHMM
High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration							
Before: Mar 4 08:26 1998							
HILT Caliper Zero Measurement	8.000	N/A	7.919	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.06	N/A	N/A	N/A	IN
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration							
Before: Mar 4 08:26 1998							
Gamma Ray Background	30.00	N/A	60.58	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	174.1	N/A	174.1	N/A	N/A	15.83	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement							
Master: Jan 10 12:42 1998 Before: Mar 4 08:27 1998							
CNTC Background	29.24	29.24	29.77	N/A	N/A	4.386	CPS
CFTC Background	25.04	25.04	25.81	N/A	N/A	3.756	CPS
High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration							
Before: Mar 4 14:11 1998							
Z-Axis Acceleration	32.19	N/A	32.14	N/A	N/A	N/A	F/S2

The GLS-VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT-B Water Temperature 64.0 DEGF.
Thermal Housing Size 3.375 IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H
Array Induction Sonde	AHIS - BA
HILT high-Resolution Mechanical Sonde	HRMS - B
HILT Rxo Gamma-ray Device	HRGD -
HILT Nuclear Back-Scatter Detector	HILT -
HILT Nuclear Short-Spacing Detector	HILT -
HILT Nuclear Long-Spacing Detector	HILT -
Micro Cylindrically Focused Log Device	MCFL -

Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Electronics Calibration Check - Thru Cal Mag. & Phase							
Idx	Phase	Value	Thru Cal Magnitude V	Nominal	Value	Phase DEG	Nominal
0	Master	0.6062		0.6050	51.07		71.00
	Before	0.6063			51.11		
1	Master	1.243		1.270	49.98		70.00
	Before	1.243			50.02		
2	Master	0.6177		0.6230	48.22		66.00
	Before	0.6178			48.28		
3	Master	0.6964		0.7040	45.44		65.00
	Before	0.6966			45.49		
4	Master	1.309		1.337	39.08		59.00
	Before	1.309			39.14		
5	Master	1.896		1.955	37.22		57.00
	Before	1.896			37.28		
	Master	1.895			37.21		

6	Before	1.396		1.955	37.27		57.00
7	Master	1.360		1.415	33.39		
	Before	1.361			33.51		53.00
		60.00 % (Minimum)	(Nominal)	140.0 % (Maximum)	Nom -80.00 (Minimum)	(Nominal)	Nom + 60.00 (Maximum)

Master: Mar 3 15:38 1998

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Electronics Calibration Check - Auxiliary							
Phase	AIT-H SPA Plus MV	Value	Phase	AIT-H SPA Zero MV	Value		
Master		992.8	Master		0.3998		
Before		992.9	Before		0.3963		
941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)		
Phase	AIT-H Temperature Plus V	Value	Phase	AIT-H Temperature Zero V	Value		
Master		0.9197	Master		0.0004027		
Before		0.9198	Before		0.0004047		
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)	-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)		

Master: Mar 3 15:38 1998

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Test Loop Gain Correction							
Idx	Value	Test Loop Gain Magnitude V	Value	Phase DEG			
0	1.015		0.3987				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
1	1.012		0.5347				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
2	1.019		-0.2321				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
3	1.015		-0.1539				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
4	0.9914		0.3521				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
5	0.9925		-0.2901				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
6	1.004		0.1364				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	
7	1.016		-0.2994				
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)	

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Sonde Error Correction							
Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M			
0	-83.66		5.647				
	-231.0 (Minimum)	-80.00 (Nominal)	119.0 (Maximum)	-2260 (Minimum)	0 (Nominal)	2260 (Maximum)	
1	161.8		-43.27				
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)	
2	107.6		-133.4				
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-380.0 (Minimum)	0 (Nominal)	380.0 (Maximum)	

3	64.57		83.37			
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-260.0 (Minimum)	0 (Nominal)	260.0 (Maximum)
4	28.88		-8.148			
	15.00 (Minimum)	28.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	14.84		-9.012			
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.814		5.059			
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.6669		9.732			
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration						
Mud Gain Correction						
Idx	Value	Coarse - Mag, Real, Imag		Value	Fine - Mag, Real, Imag	
0	1.099		0.8000 (Minimum)	1.097		0.6000 (Minimum)
			1.000 (Nominal)			1.000 (Nominal)
			1.400 (Maximum)			1.400 (Maximum)
1	1.099		0.6000 (Minimum)	1.097		0.6000 (Minimum)
			1.000 (Nominal)			1.000 (Nominal)
			1.400 (Maximum)			1.400 (Maximum)
2	1.099		0.6000 (Minimum)	1.097		0.6000 (Minimum)
			1.000 (Nominal)			1.000 (Nominal)
			1.400 (Maximum)			1.400 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration											
Stab Measurement Summary											
Phase	BS Window Ratio		Value	Phase	SS Window Ratio		Value	Phase	LS Window Ratio		Value
Before			1.005	Before			0.4873	Before			0.3009
	0.9837 (Minimum)	1.004 (Nominal)	1.054 (Maximum)		0.4623 (Minimum)	0.4887 (Nominal)	0.5110 (Maximum)		0.2874 (Minimum)	0.3026 (Nominal)	0.3177 (Maximum)
Phase	BS Window Sum CPS		Value	Phase	SS Window Sum CPS		Value	Phase	LS Window Sum CPS		Value
Before			15350	Before			12810	Before			1506
	14890 (Minimum)	15360 (Nominal)	16130 (Maximum)		12190 (Minimum)	12830 (Nominal)	13470 (Maximum)		1440 (Minimum)	1516 (Nominal)	1592 (Maximum)

Before: Mar 4 08:29 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Photo-multiplier High Voltages Calibrations								
Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1514	Before		1683	Before		1801
	1386 (Minimum)	1496 (Nominal)	1598 (Maximum)		1598 (Minimum)	1698 (Nominal)	1798 (Maximum)	
Before: Mar 4 08:29 1998								

Before: Mar 4 08:29 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration											
Crystal Quality Resolutions Calibration											
Phase	BS Crystal Resolution %		Value	Phase	SS Crystal Resolution %		Value	Phase	LS Crystal Resolution %		Value
Before			12.40	Before			10.15	Before			9.389
	11.13 (Minimum)	12.13 (Nominal)	13.13 (Maximum)		9.185 (Minimum)	10.18 (Nominal)	11.18 (Maximum)		8.332 (Minimum)	9.332 (Nominal)	10.33 (Maximum)

Before: Mar 4 08:29 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration											
MCFL Calibration											
Phase	Raw B0 Resistivity OHMM		Value	Phase	Raw B1 Resistivity OHMM		Value	Phase	Raw B2 Resistivity OHMM		Value
Before			3835	Before			3822	Before			3814
	3585 (Minimum)	3875 (Nominal)	4185 (Maximum)		3524 (Minimum)	3830 (Nominal)	4138 (Maximum)		3524 (Minimum)	3830 (Nominal)	4138 (Maximum)

Before: Mar 4 08:34 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
HILT Caliper Calibration							
Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value		
Before		7.919	Before		12.08		
	6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)		9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Detector Calibration							
Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI
Before		80.88	Before		174.1	Before	
	0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)		158.3 (Minimum)	174.1 (Nominal)	190.0 (Maximum)

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Zero Measurement							
Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value		
Master		28.24	Master		25.04		
Before		28.71	Before		25.81		
	5.000 (Minimum)	28.00 (Nominal)	5.000 (Maximum)		5.000 (Minimum)	25.04 (Nominal)	40.00 (Maximum)
Master: Jan 10 12:41 1998			Before: Mar 4 08:27 1998				

High resolution Integrated Logging Tool-CTS Wellsite Calibration							
Accelerometer Calibration							
Phase	Z-Axis Acceleration F/S2	Value					
Before		32.14					
	31.53 (Minimum)	32.19 (Nominal)	32.84 (Maximum)				
Before: Mar 4 14:11 1998							

RECEIVED MAR 6 1998

COMPANY:	PETROGLYPH OPERATING COMPANY INC.	BOTTOM LOG INTERVAL	6030 F
WELL:	UTE TRIBAL 31-07	SCHLUMBERGER DEPTH	6046 F
FIELD:	ANTELOPE CREEK	DEPTH DRILLER	6063 F
COUNTY:	DUCHESNE	KELLY BURDEN	6803 1/2 F
STATE:	UTAH	DRILL FLUID	6802 1/2 F
		GROUTING LEVEL	6793 1/2 F

Schlumberger

COMPENSATED NEUTRON
LITHODENSITY
GAMMA RAY

COMPANY: PETROGLYPH OPERATING

COMPANY INC.

WELL: UTE TRIBAL 31-07

FIELD: ANTELOPE CREEK

COUNTY: DUCHESNE STATE: UTAH

Schlumberger
ARRAY INDUCTION
LINEAR CORRELATION
GAMMA RAY

COUNTY: DUCHESNE		FIELD: ANTELOPE CREEK	
WELL: UTE TRIBAL 31-07		LOCATION	
Field:	ANTELOPE CREEK	Permanent Datum:	1976' FNL & 2168' FEL
Location:	1976' FNL & 2168' FEL	Log Measured From:	SW / NE
Well:	UTE TRIBAL 31-07	Drilling Measured From:	KELLY BUSHING
Company:	PETROGLYPH OPERATING	API Serial No.:	PCW
	43-013-32036	SECTION	5S
Logging Date	4-MAR-1998	TOWNSHIP	31
Run Number	ONE	RANGE	3W
Depth Driller	6063 F	Logging Date	
Schlumberger Depth	6046 F	Run Number	
Bottom Log Interval	6040 F	Depth Driller	
Top Log Interval	275 F	Schlumberger Depth	
Casing Driller Size @ Depth	8 785 IN	Bottom Log Interval	
Casing Schlumberger	@	Top Log Interval	
Bit Size	275 F	Casing Driller Size @ Depth	
Type Fluid In Hole	7.875 IN	Casing Schlumberger	
Density	8.3 LB/G	Bit Size	
Fluid Loss	27 S	Type Fluid In Hole	
Source Of Sample	10.3	Density	
RM @ Measured Temperature	FLOWLINE	Fluid Loss	
RMF @ Measured Temperature	4.290 OHMM	PH	
RMC @ Measured Temperature	4.290 OHMM	Source Of Sample	
Source RMF	FLOWLINE	RM @ Measured Temperature	
RM @ MRT	1.889	RMF @ Measured Temperature	
Maximum Recorded Temperatures	(@) 126	RMC @ Measured Temperature	
Circulation Stopped	1.889	Source RMF	
Logger On Bottom	126 DEGF	RM @ MRT	
Time	4-MAR-1998	RMF @ MRT	
Unit Number	8426	Maximum Recorded Temperatures	
Recorded By	VERNAL, UTAH	Circulation Stopped	
	K. NELSON & F. ORTIZ	Time	
Witnessed By	CHUCK WHITE	Logger On Bottom	
		Unit Number	
		Location	
		Recorded By	
		Witnessed By	

Run 1

Run 2

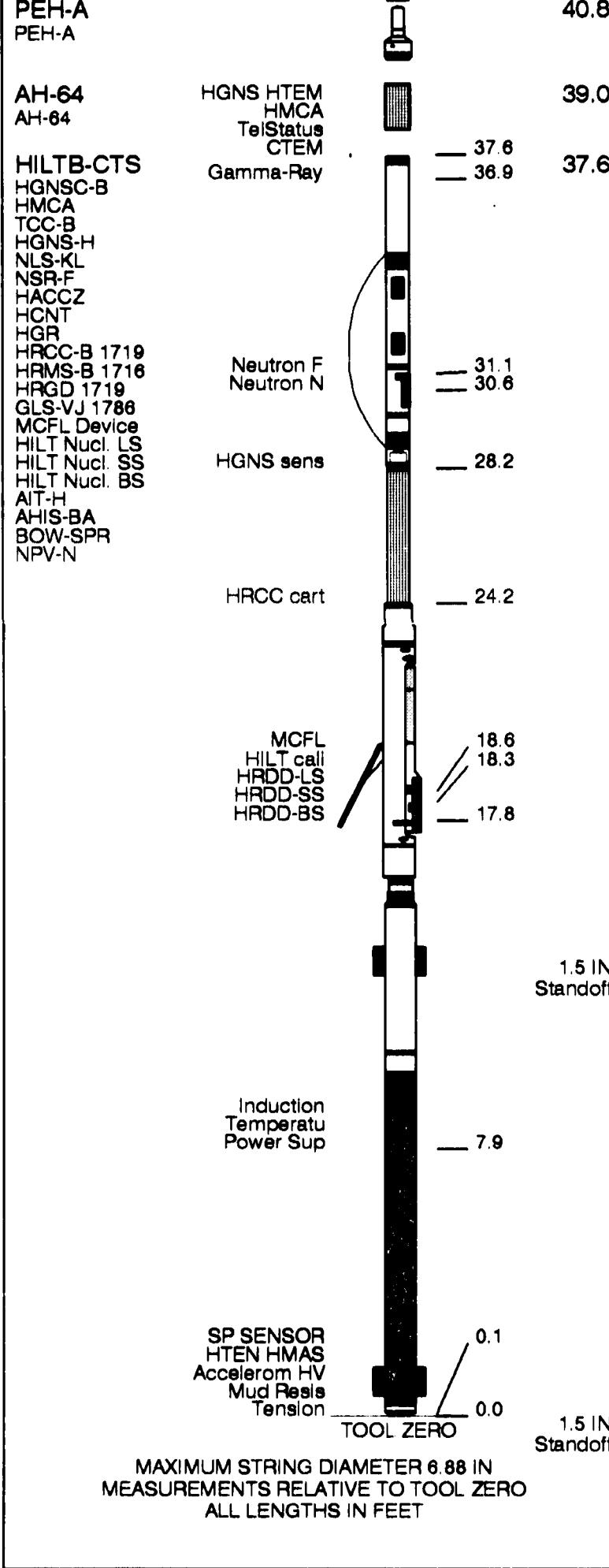
Run 3
Run 4

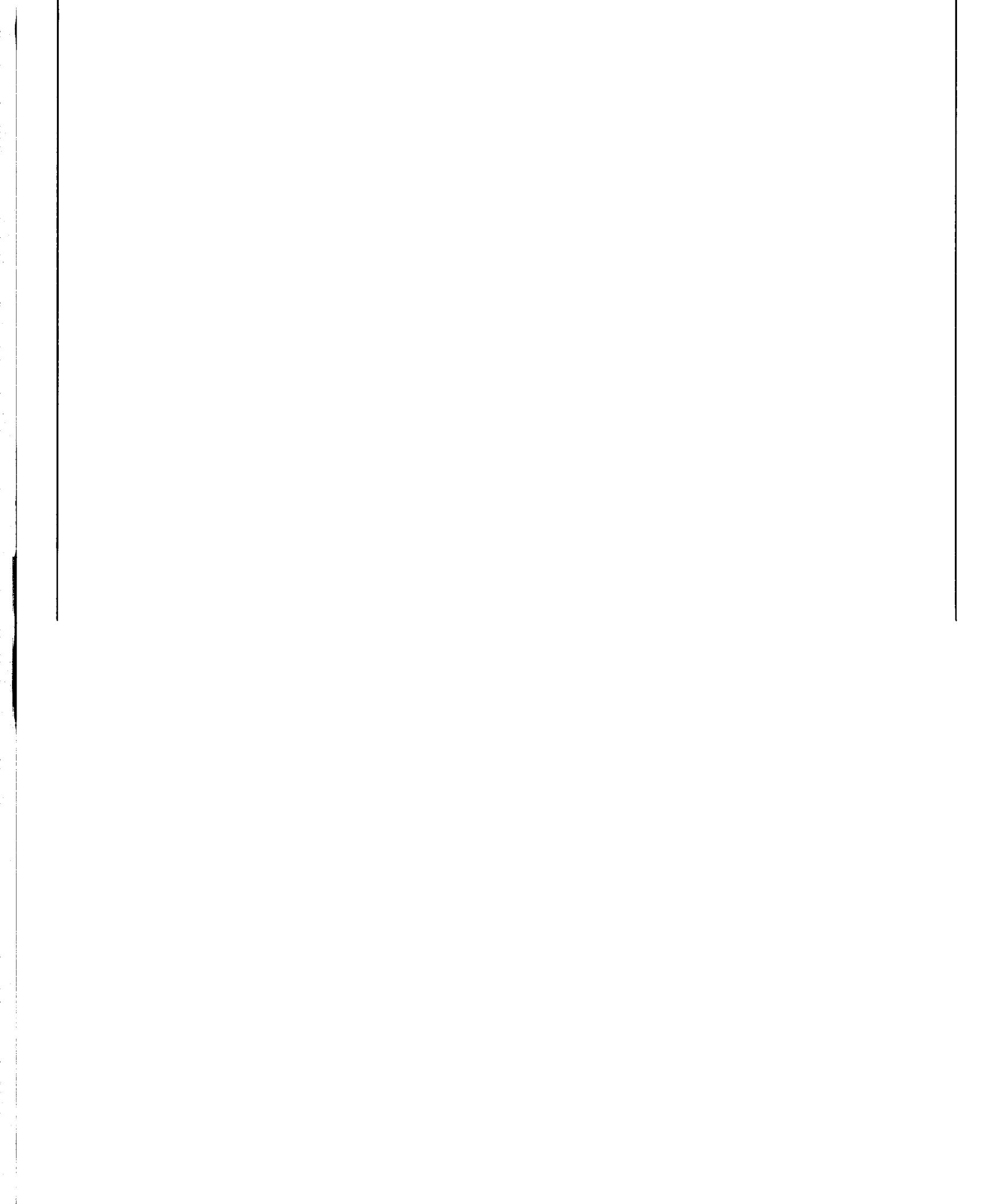
ALL INTERPRETATIONS ARE OPINIONS BASED ON INFERENCES FROM ELECTRICAL OR OTHER MEASUREMENTS AND WE CANNOT, AND DO NOT GUARANTEE THE ACCURACY OR CORRECTNESS OF ANY INTERPRETATIONS, AND WE SHALL NOT, EXCEPT IN THE CASE OF GROSS OR WILLFUL NEGLIGENCE ON OUR PART, BE LIABLE OR RESPONSIBLE FOR ANY LOSS, COSTS, DAMAGES OR EXPENSES INCURRED OR SUSTAINED BY ANYONE RESULTING FROM ANY INTERPRETATION MADE BY ANY OF OUR OFFICERS, AGENTS OR EMPLOYEES. THESE INTERPRETATIONS ARE ALSO SUBJECT TO CLAUSE 4 OF OUR GENERAL TERMS AND CONDITIONS AS SET OUT IN OUR CURRENT PRICE SCHEDULE.

OTHER SERVICES1 OS1: OS2: OS3: OS4: OS5:	OTHER SERVICES2 OS1: OS2: OS3: OS4: OS5:
REMARKS: RUN NUMBER 1 BOW SPRING USED ON NEUTRON TOOL. STANDOFF SIZES WERE 1.5 INCHES. CHLORIDES WERE 700PPM. PRIMARY DEPTH SYSTEM USED. TODAYS CREW WAS: K. JOHNS AND B. SLAMA	REMARKS: RUN NUMBER 2
AFE# 41488	
RUN 1 SERVICE ORDER #: 1067325 PROGRAM VERSION: 7C0-712 FLUID LEVEL:	RUN 2 SERVICE ORDER #: PROGRAM VERSION: FLUID LEVEL:
LOGGED INTERVAL START STOP	LOGGED INTERVAL START STOP

EQUIPMENT DESCRIPTION

RUN 1	RUN 2
SURFACE EQUIPMENT TCM-AB GSR-U/Y NCT-B CNB-AB	
DOWNHOLE EQUIPMENT	





Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11	6054.0 FT	78.0 FT
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11	6054.0 FT	78.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2171.45 F3

Cement Volume = 1217.93 F3 (assuming 5.50 IN casing O.D.)

Computed from 6054.0 FT to 275.0 FT using data channel(s) HCAL

OP System Version: 7C0-712 DBM

HILT-B-CTS
HOLEV

RPCV-999
RPCV-999

RWA

RPCV-999

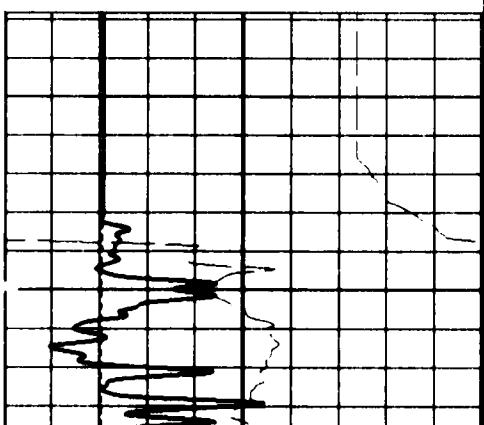
PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

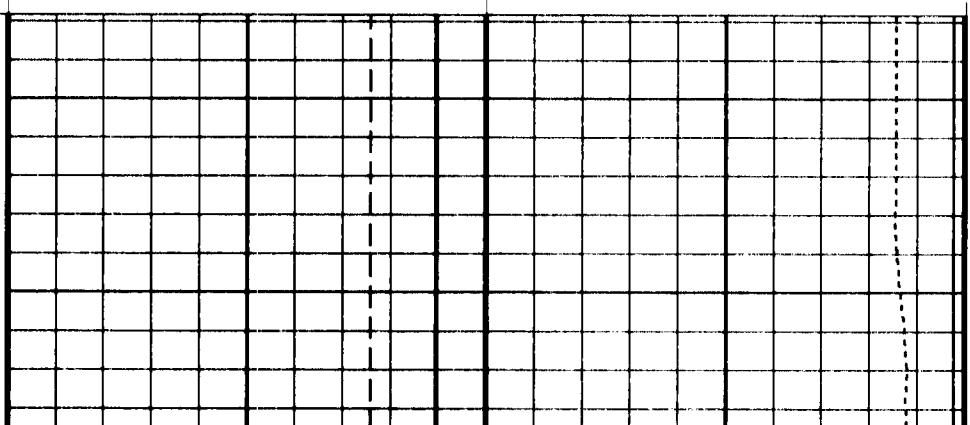
Time Mark Every 60 S

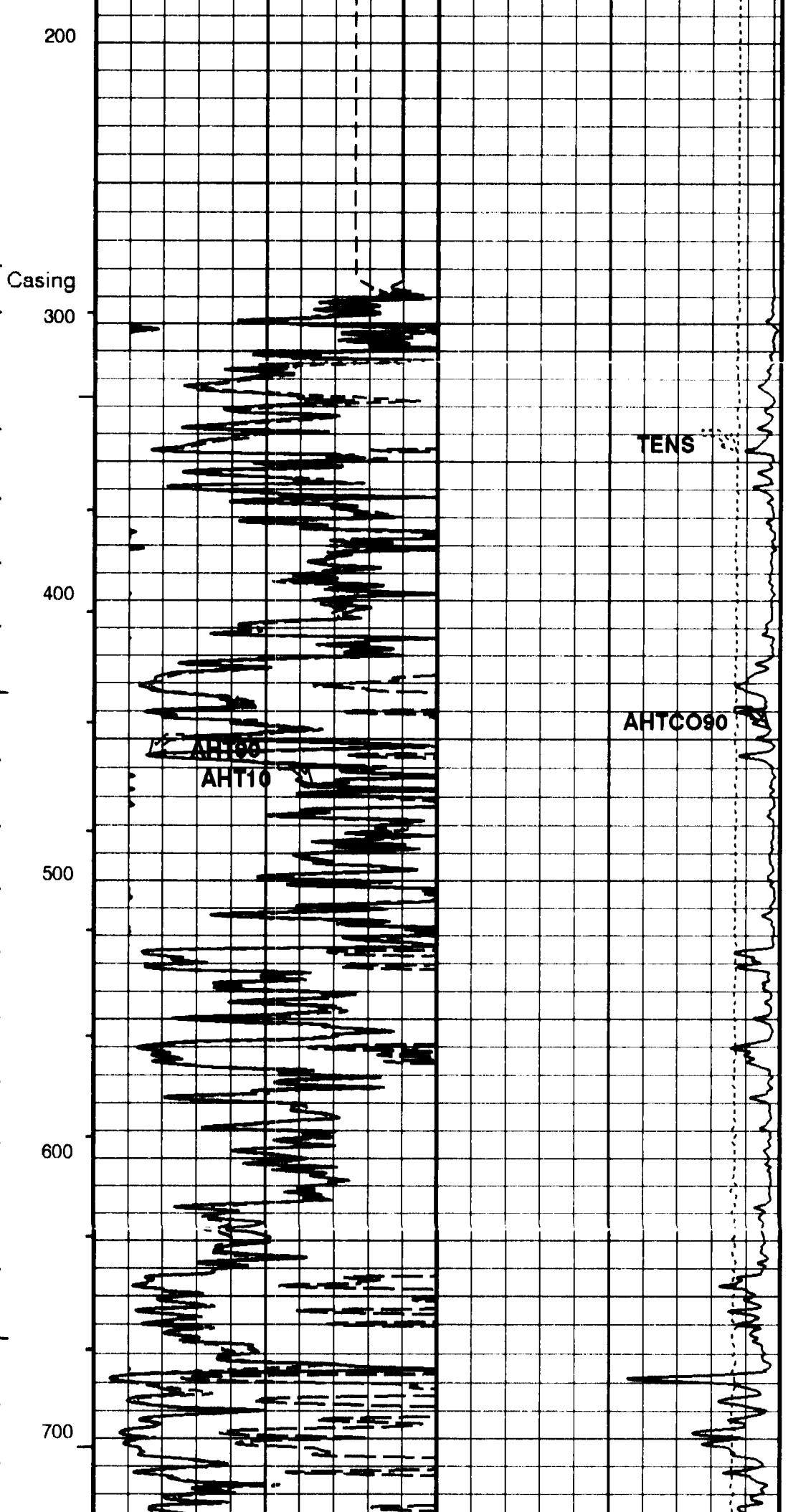
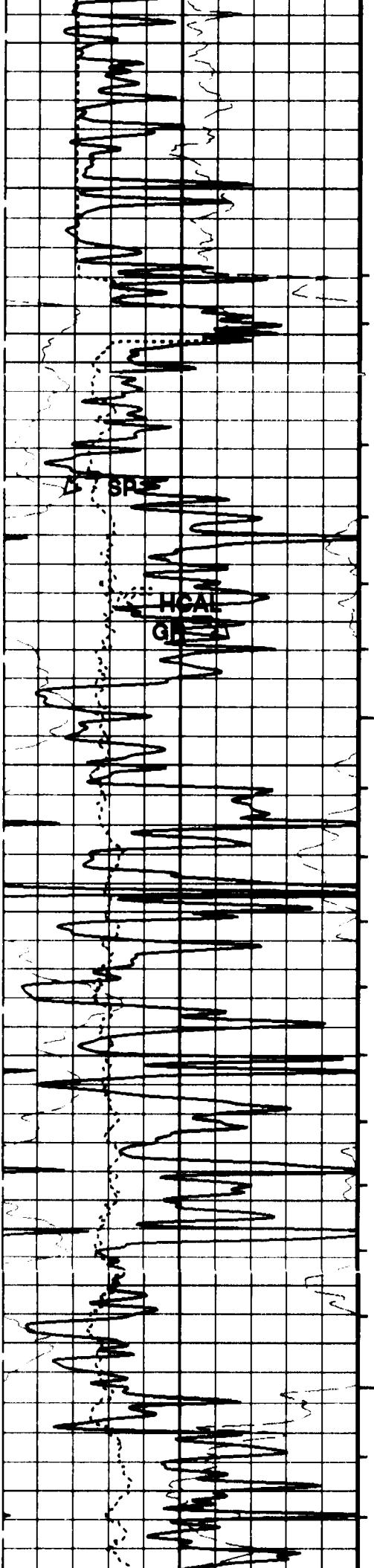
Caliper (HCAL)		
6	(IN)	16
Gamma Ray (GR)		
0	(GAPI)	200
SP (SP)		
-80	(MV)	20

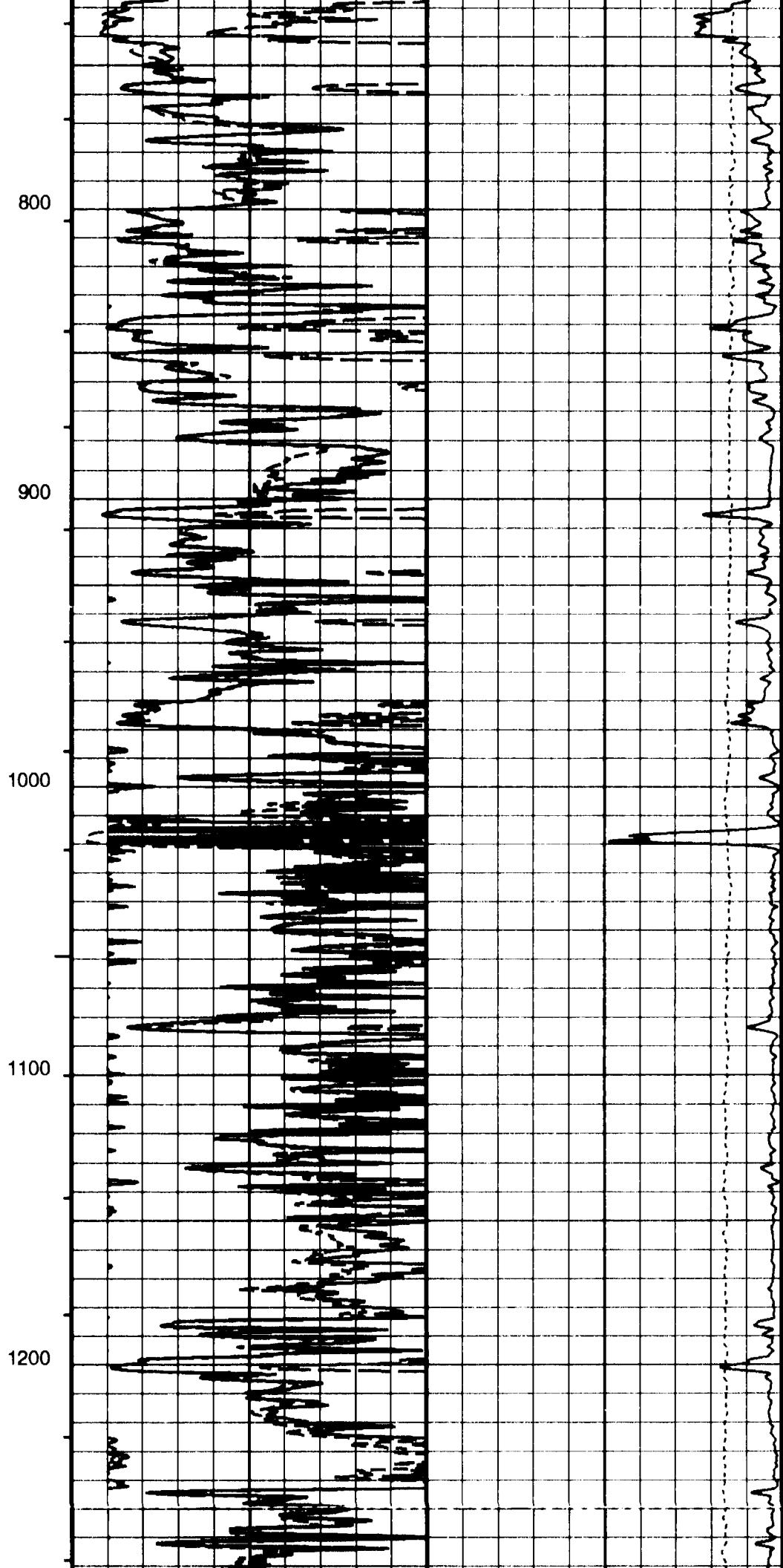
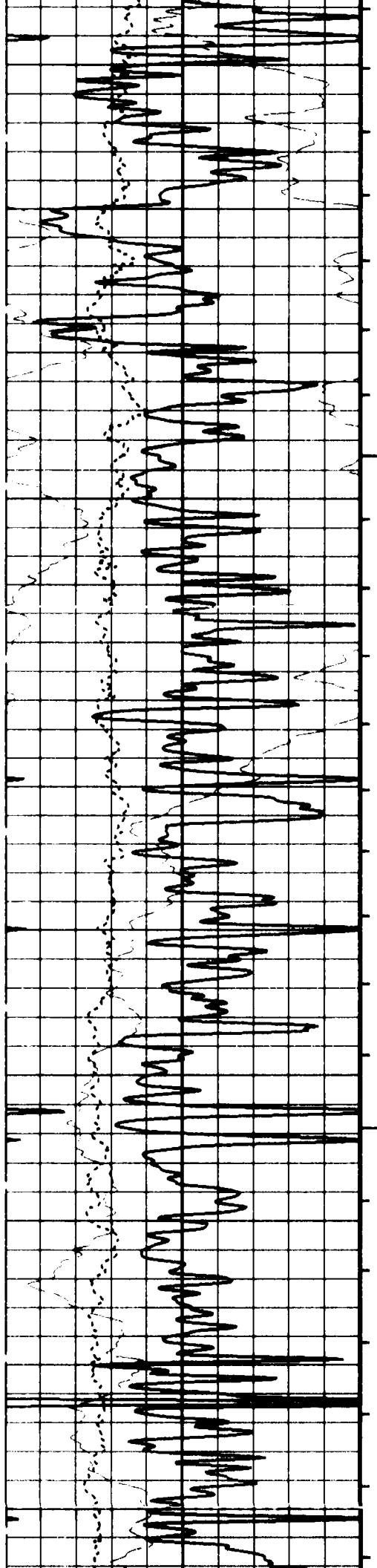
AIT-H 10 Inch Investigation (AHT10) 0 (OHMM) 20	MAIN PASS
AIT-H 90 Inch Investigation (AHT90) 0 (OHMM) 100 10000	Tension (TENS) (LBF) 0
AIT-H 10 Inch Investigation (AHT10) 0 (OHMM) 100 500	AIT-H 90 Inch Investigation Conductivity (AHTCO90) (MM/M) 0

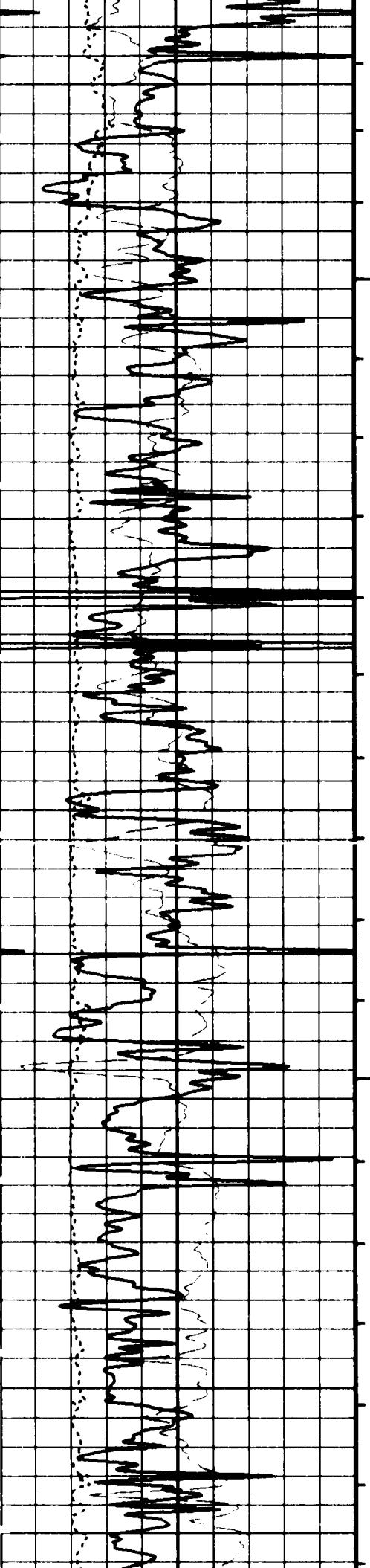


100









1300

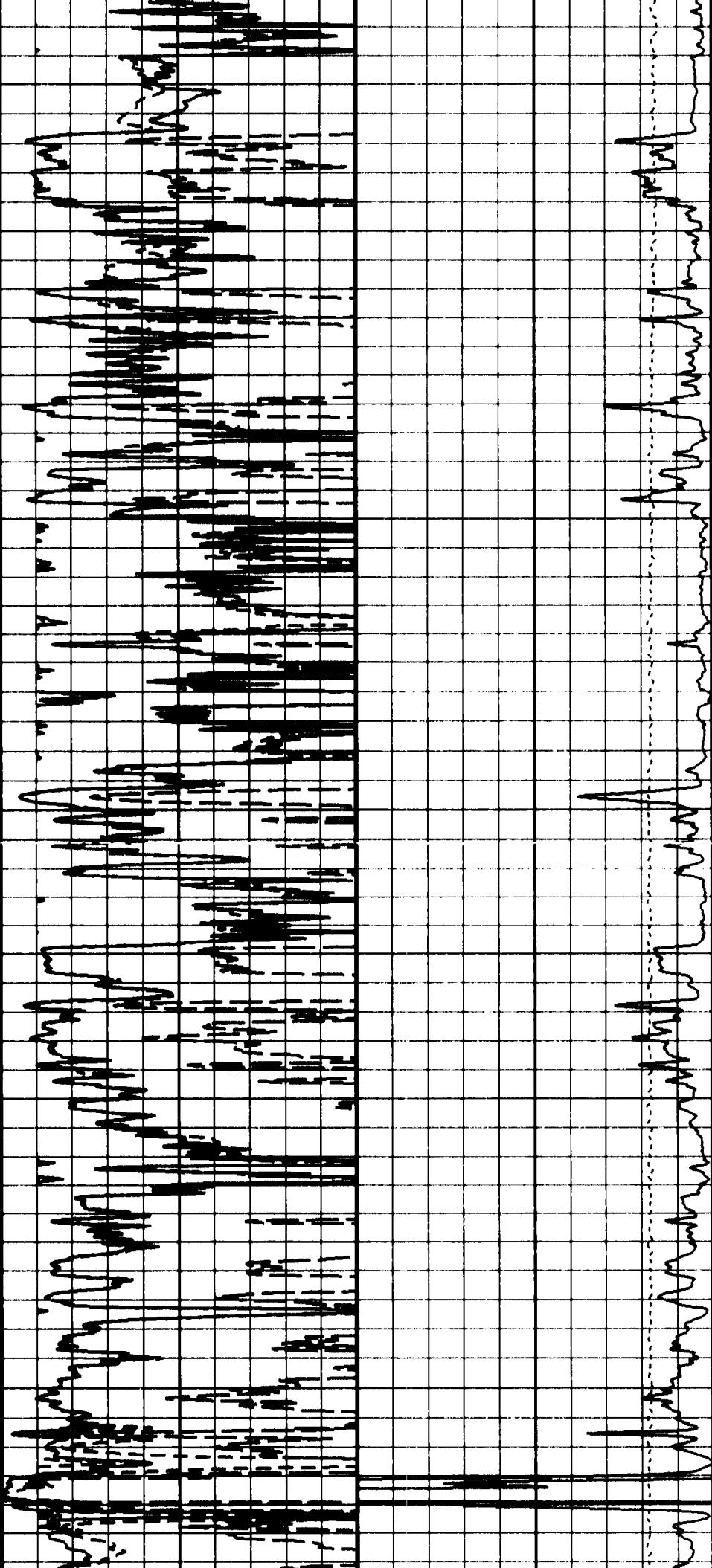
1400

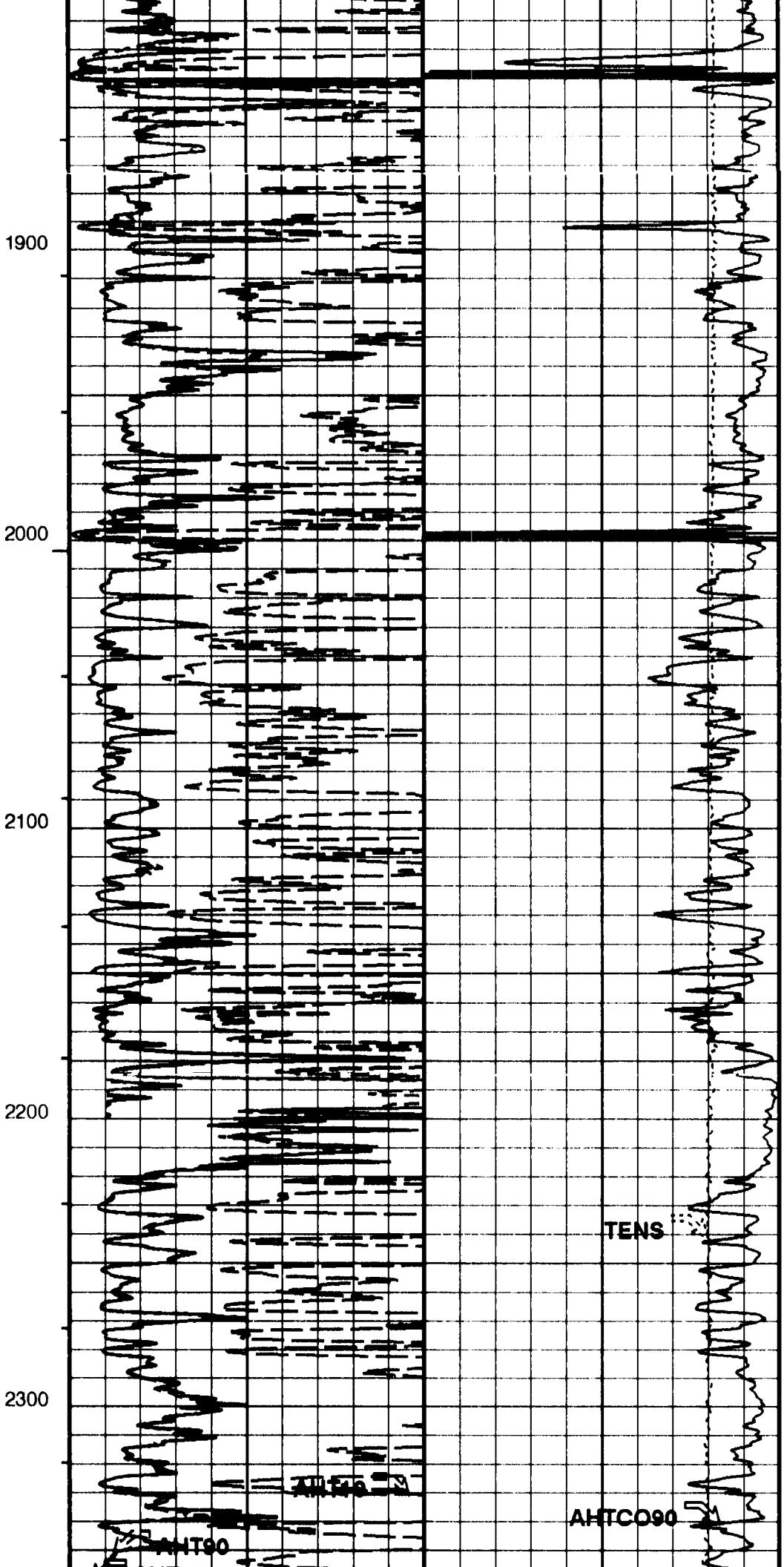
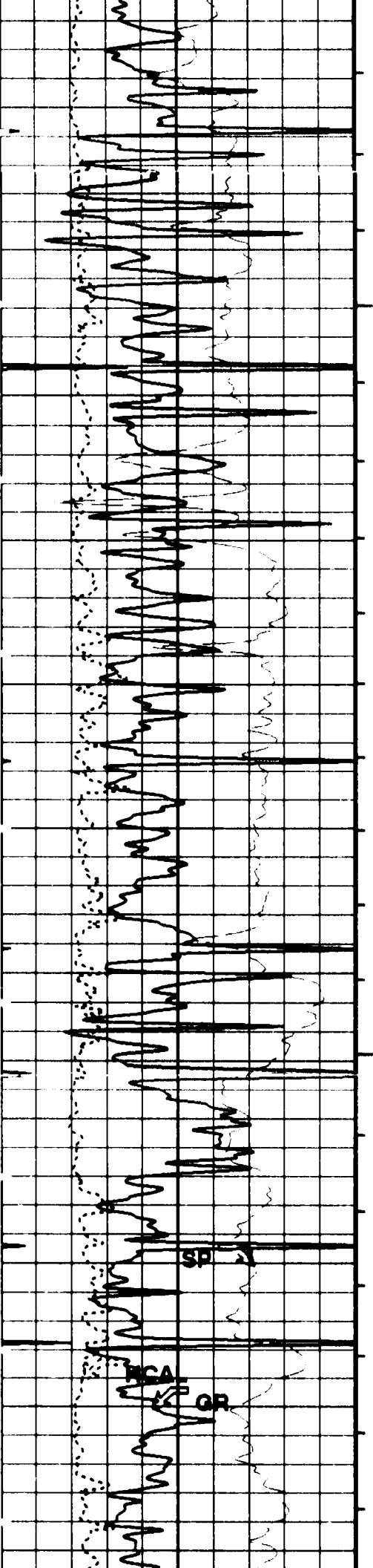
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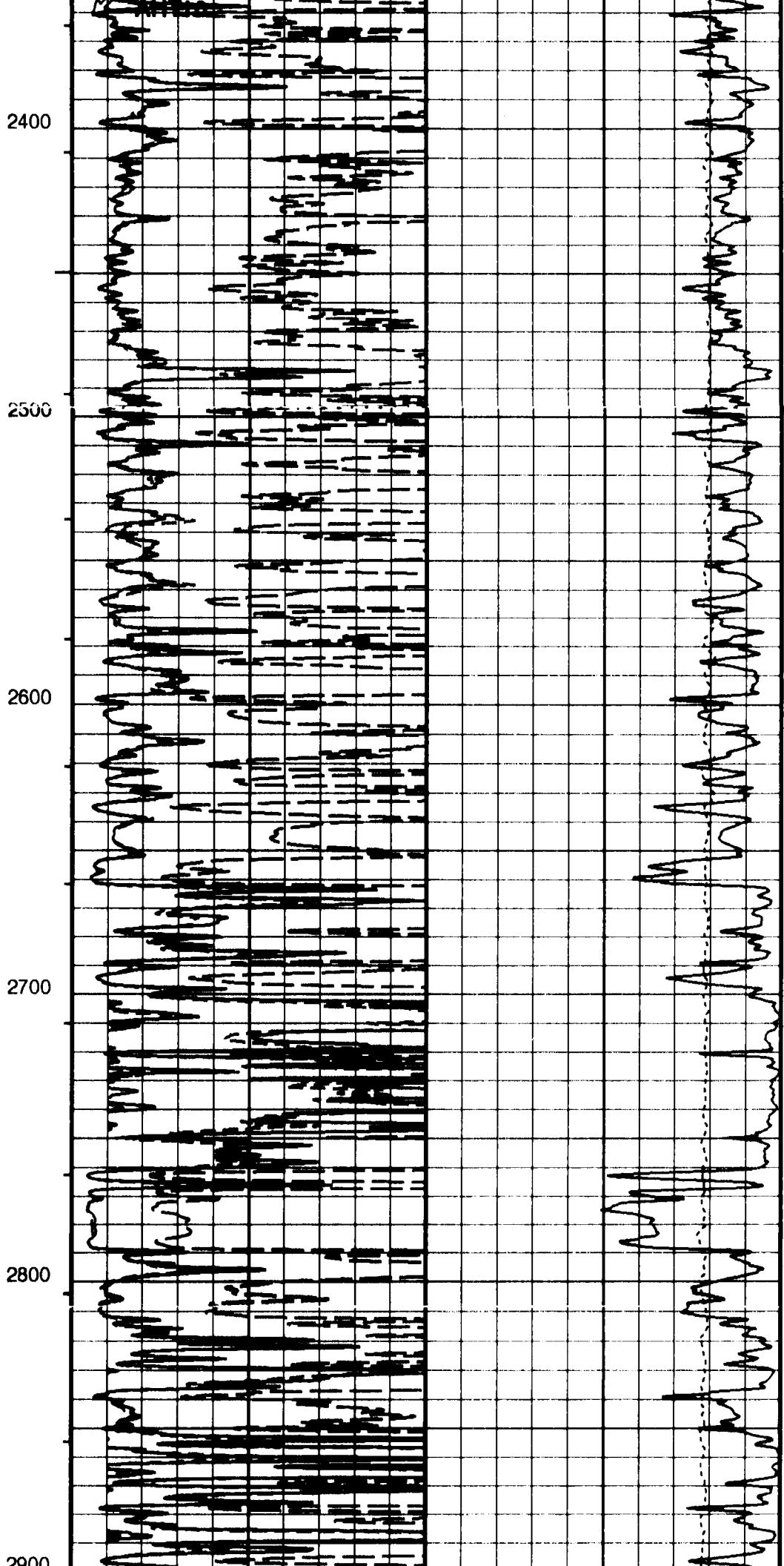
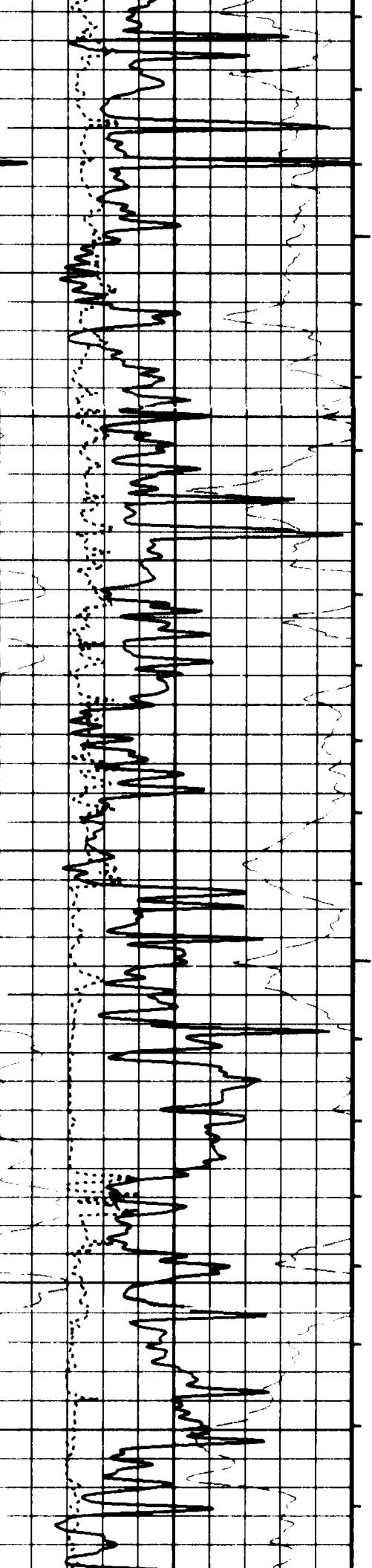
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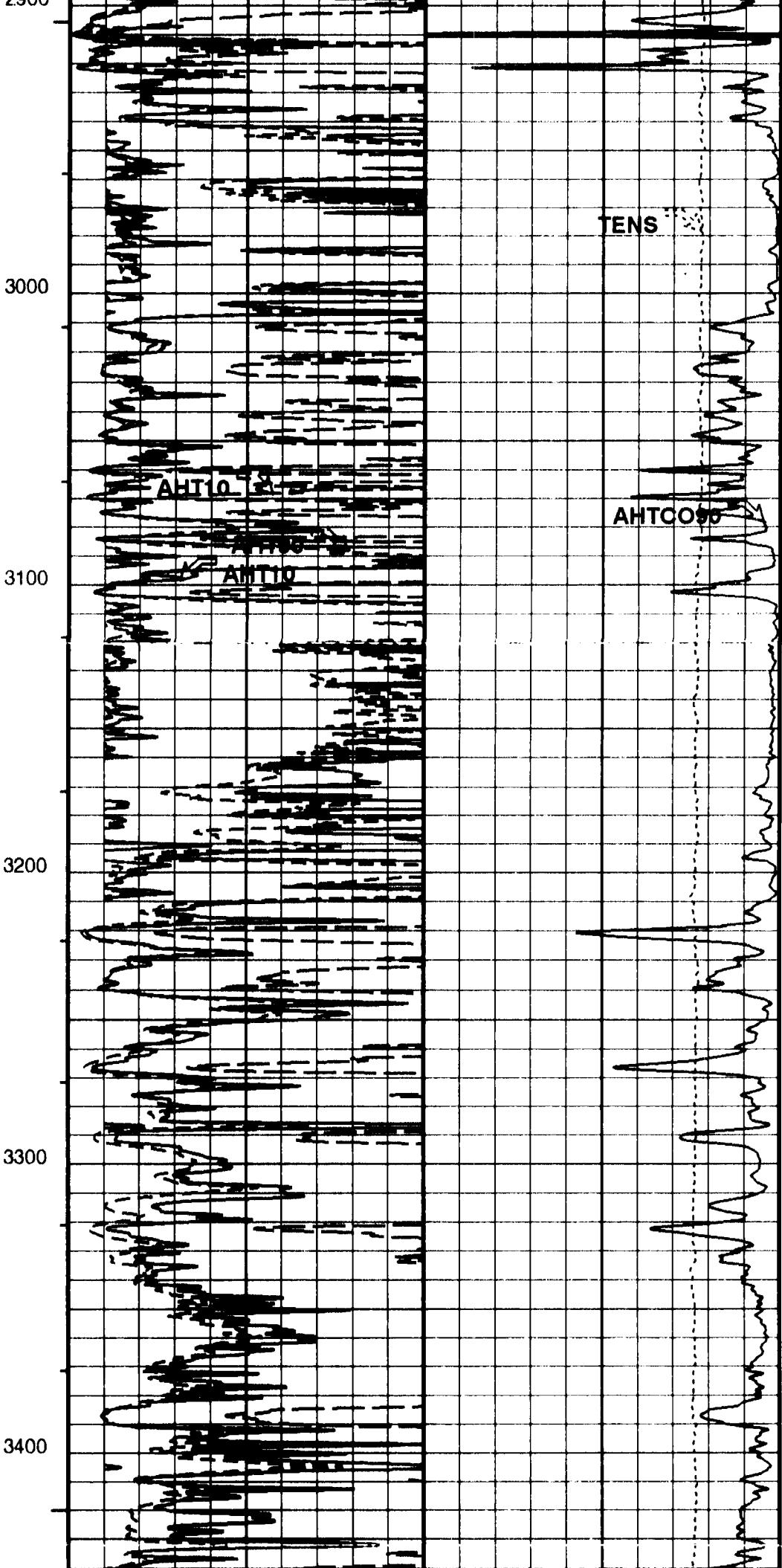
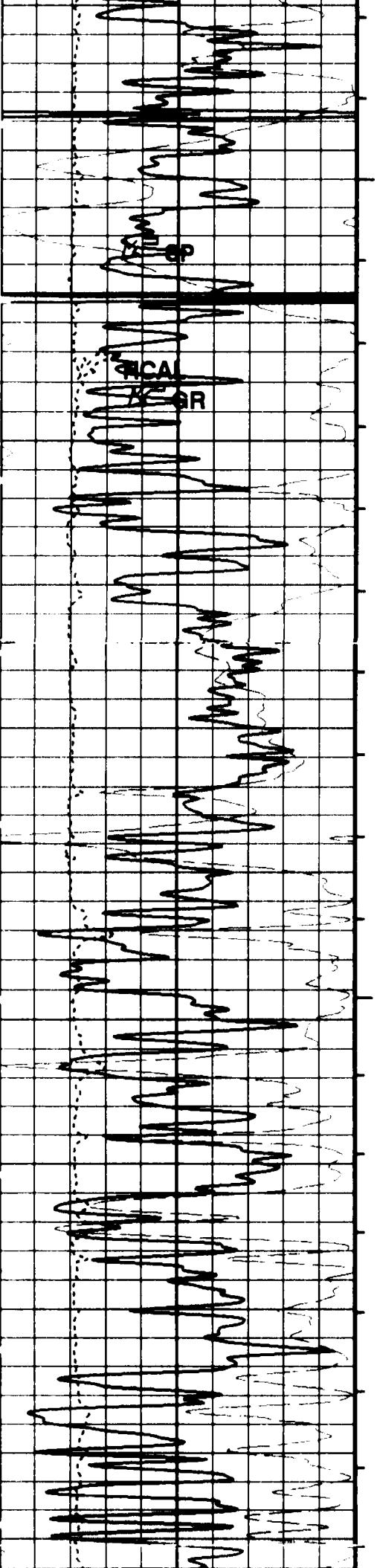
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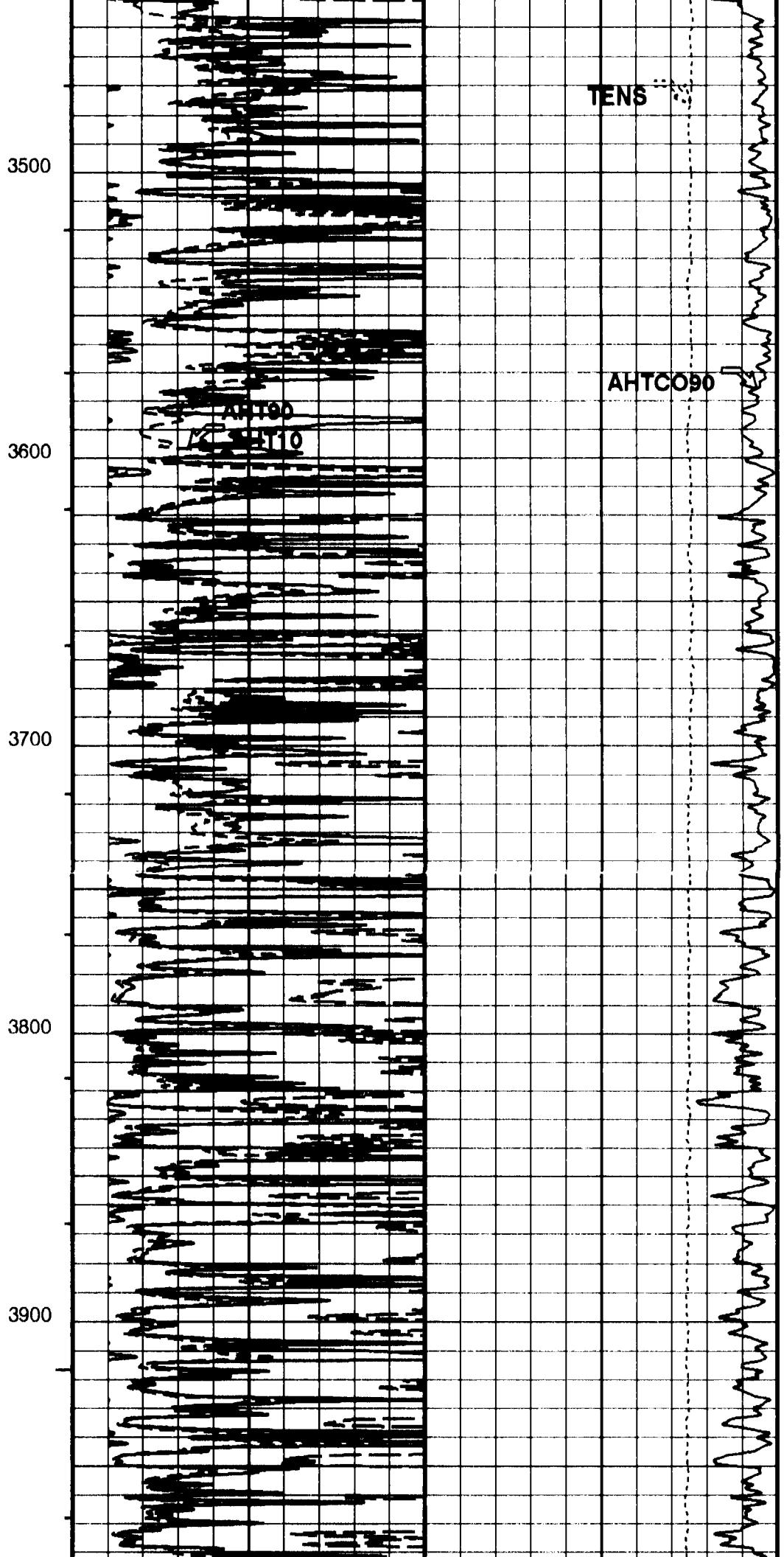
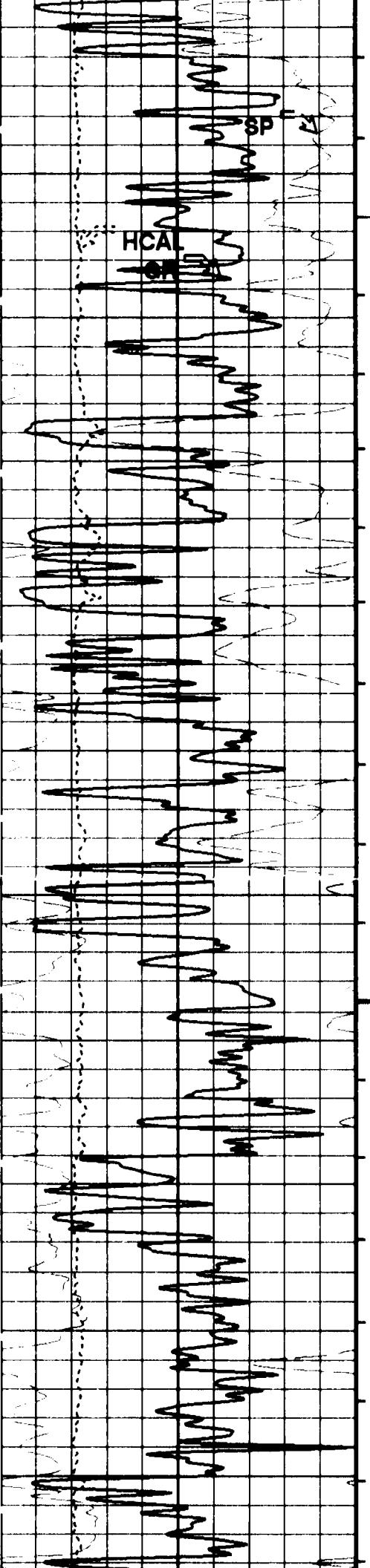
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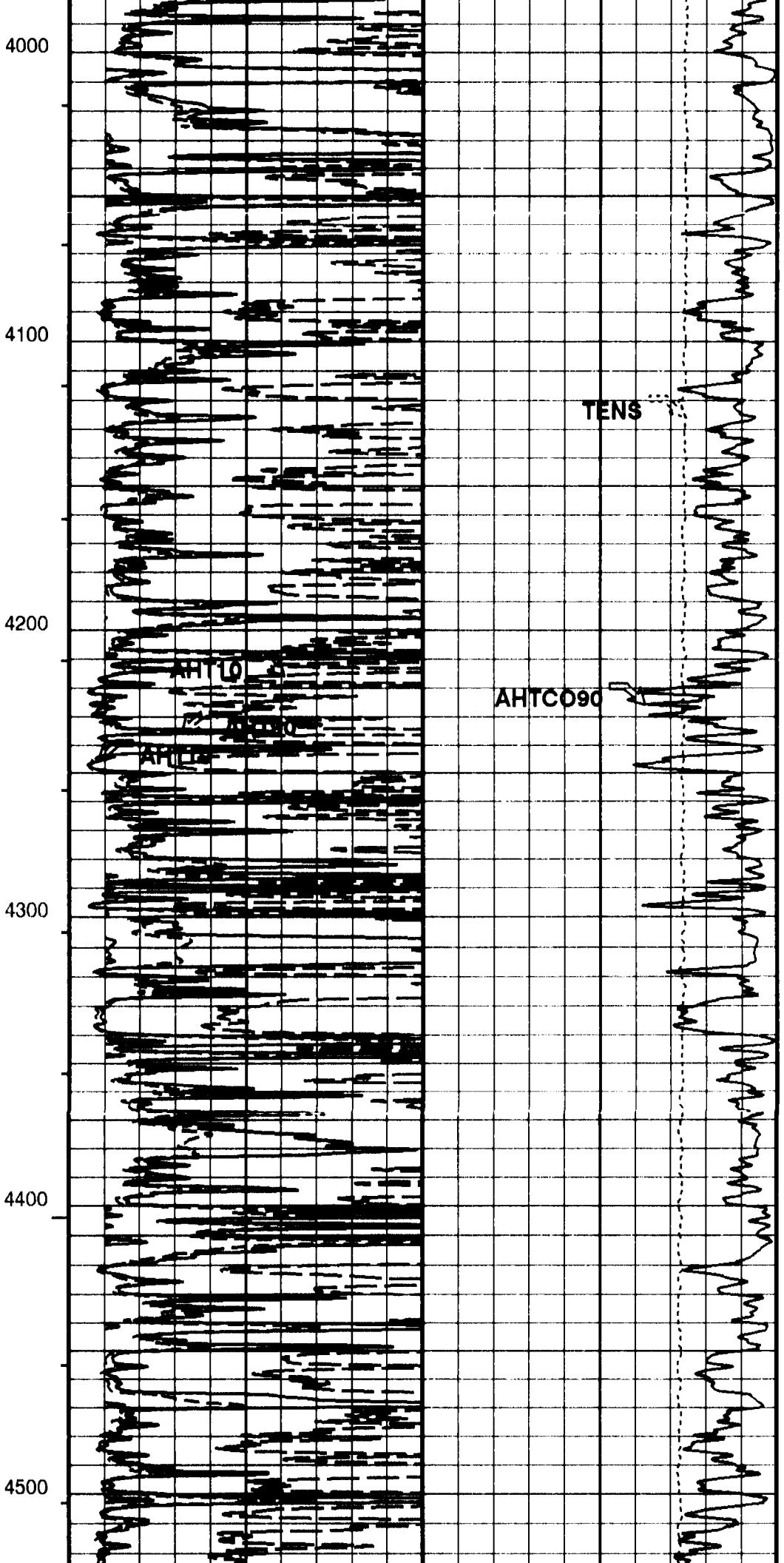
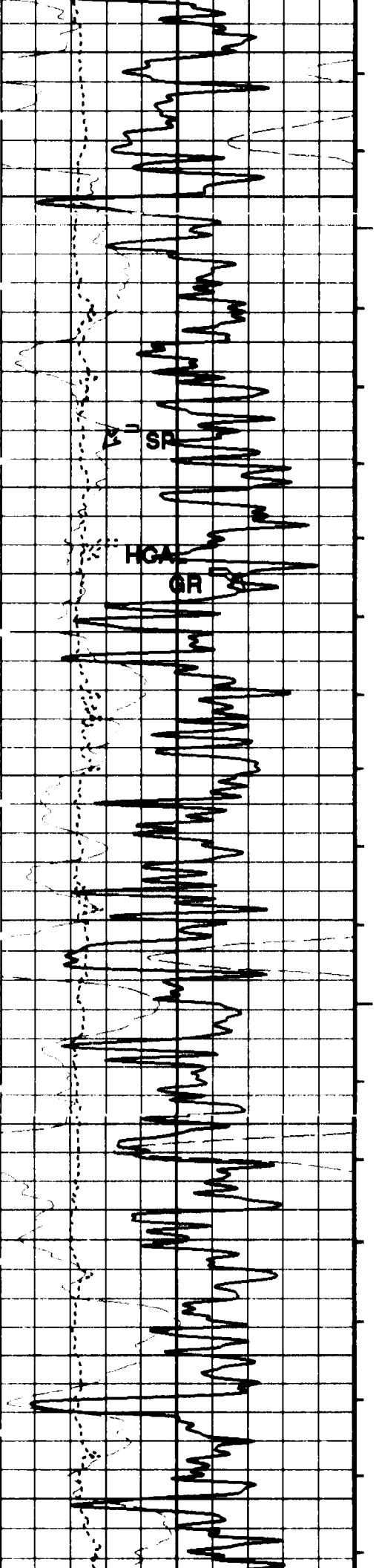


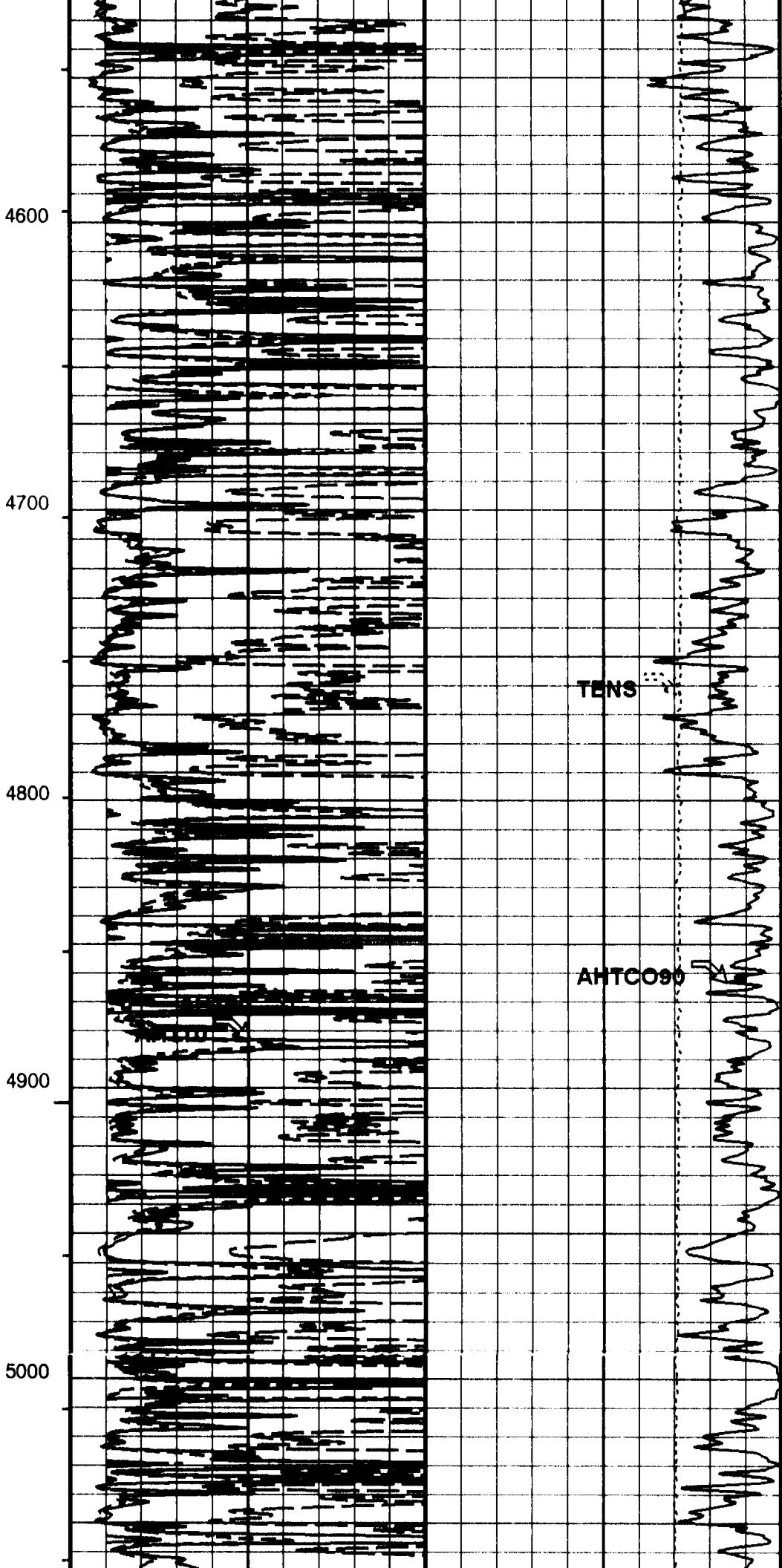
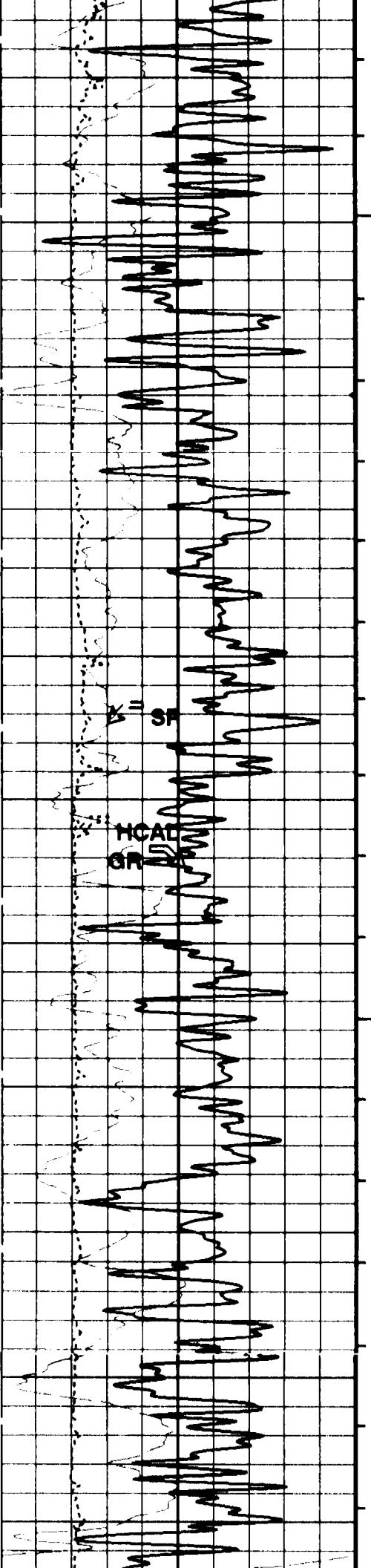


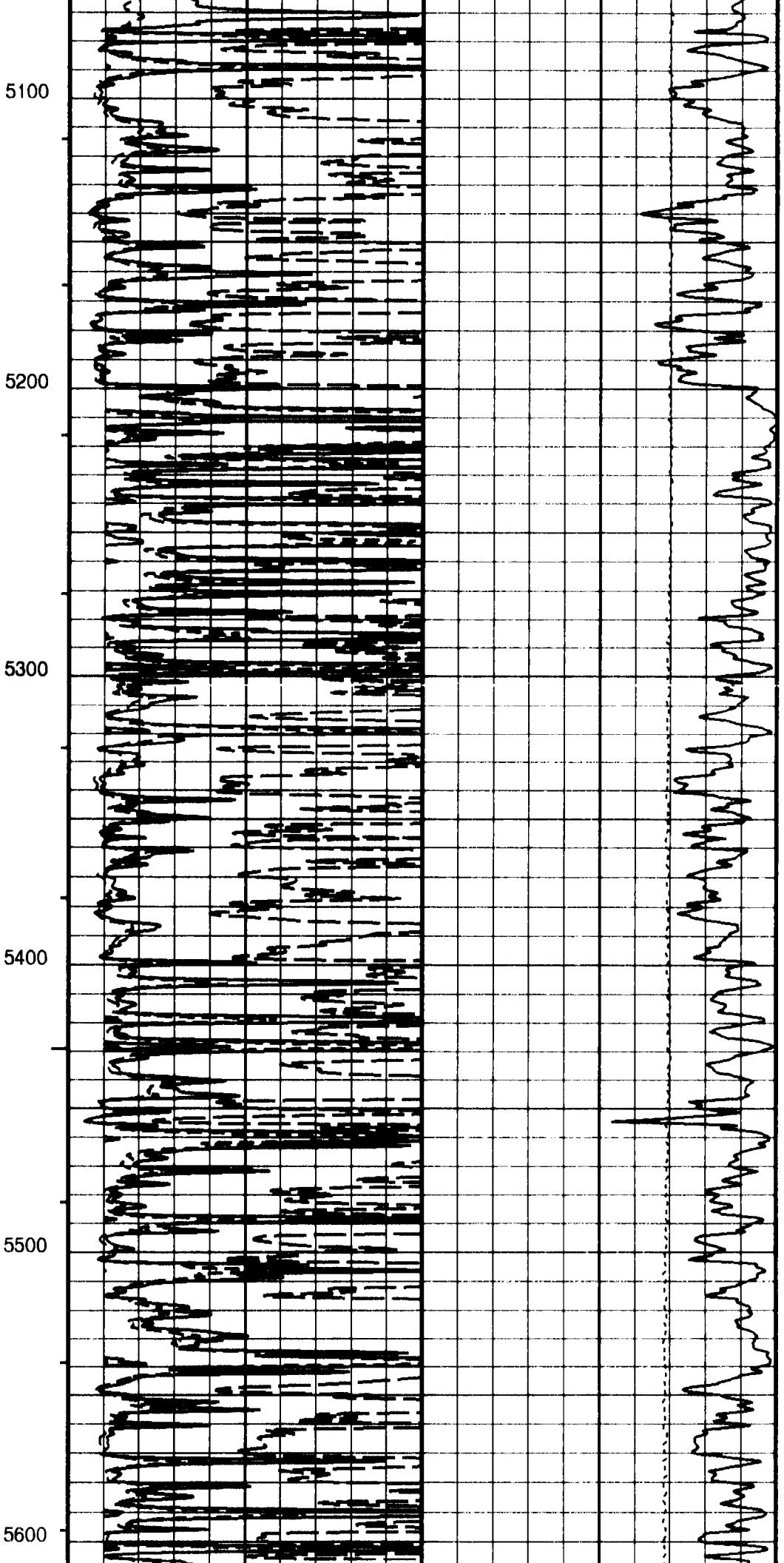
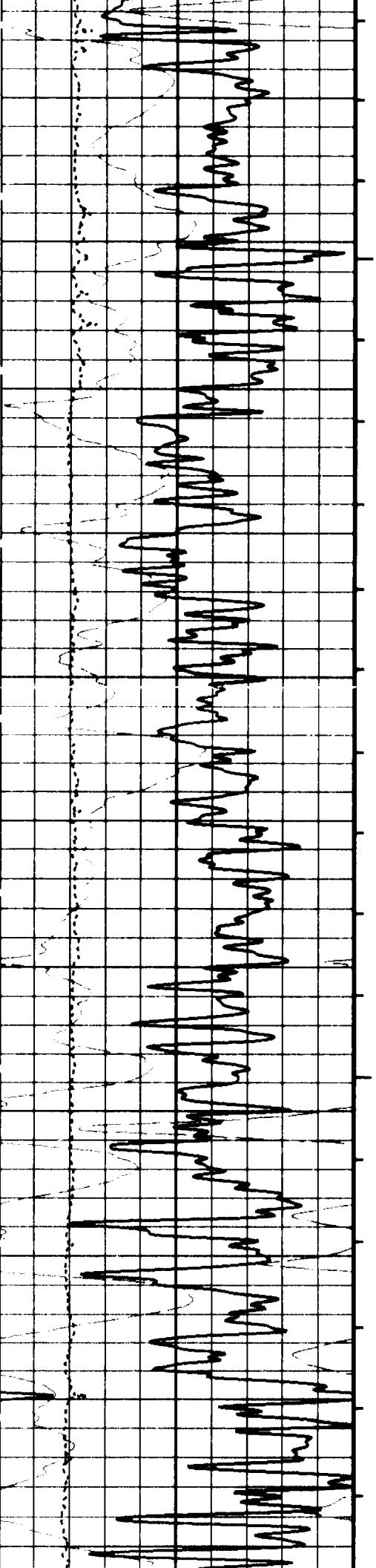


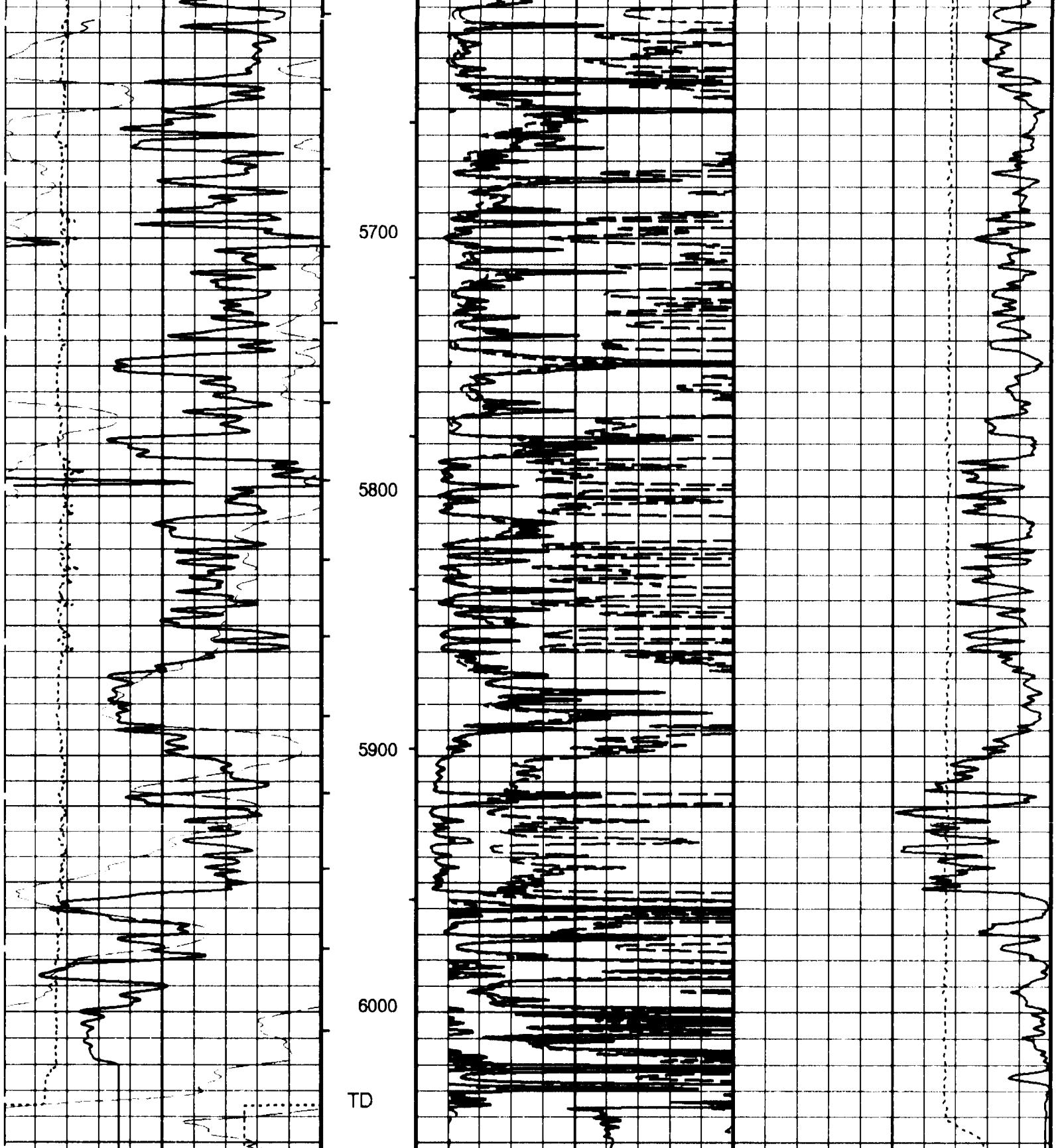












SP (SP)
(MV) 20

Gamma Ray (GR)
(GAPI) 200

Caliper (HCAL)
(IN) 16

AIT-H 10 Inch Investigation (AHT10)
(OHMM) 100

AIT-H 90 Inch Investigation (AHT90)
(OHMM) 100

AIT-H 10 Inch Investigation (AHT10)
(OHMM) 20

AIT-H 90 Inch Investigation Conductivity
(AHTC90)
(MM/M) 0

Tension (TENS)
(LBF) 0

PIP SUMMARY

Integrated Hole Volume Minor Pip Every 10 F3

MAIN PASS

- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

Parameters

DLIS Name	Description	Value
AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff
AHBLM	AIT-H Basic Logs Mode	1_Two
AHCDE	AIT-H Casing Detection Enable	Yes
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000
AHMRF	AIT-H Mud Resistivity Factor	FT
AHSTA	AIT-H Tool Standoff	1
BHT	Bottom Hole Temperature (used in calculations)	1.5
BS	Bit Size	IN
DFD	Drilling Fluid Density	140
FEXP	Form Factor Exponent	7.875
FNUM	Form Factor Numerator	8.30
GCSE	Generalized Caliper Selection	2
GDEV	Average Angular Deviation of Borehole from Normal	1
GGRD	Geothermal Gradient	HCAL
GRSE	Generalized Mud Resistivity Selection	0
GTSE	Generalized Temperature Selection	1.000000e-02
HSCM	HILT Speed Correction Mode	AITH_RESIST
HSTI	STI Uses HILT Acceleration	LINEAR_ESTIMATE
MST	Mud Sample Temperature	NO SC
SHT	Surface Hole Temperature	NO
SPNV	SP Next Value	52.00
TD	Total Depth	DEGF
		68
		0
		MV
		6063
		FT

Format: AIT_BasicLinTwo Vertical Scale: 2" per 100'

Graphics File Created: 4-MAR-1998 15:11

OP System Version: 7C0-712 DBM

HILTB-CTS	RPCV-999	RWA	RPCV-999
HOLEV	RPCV-999		

Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11

Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11	8054.0 FT	78.0 FT
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11	8054.0 FT	78.0 FT

Integrated Hole/Cement Volume Summary

Hole Volume = 2171.45 F3

Cement Volume = 1217.93 F3 (assuming 5.50 IN casing O.D.)

Computed from 8054.0 FT to 275.0 FT using data channel(s) HCAL

OP System Version: 7C0-712 DBM

HILTB-CTS	RPCV-999	RWA	RPCV-999
HOLEV	RPCV-999		

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

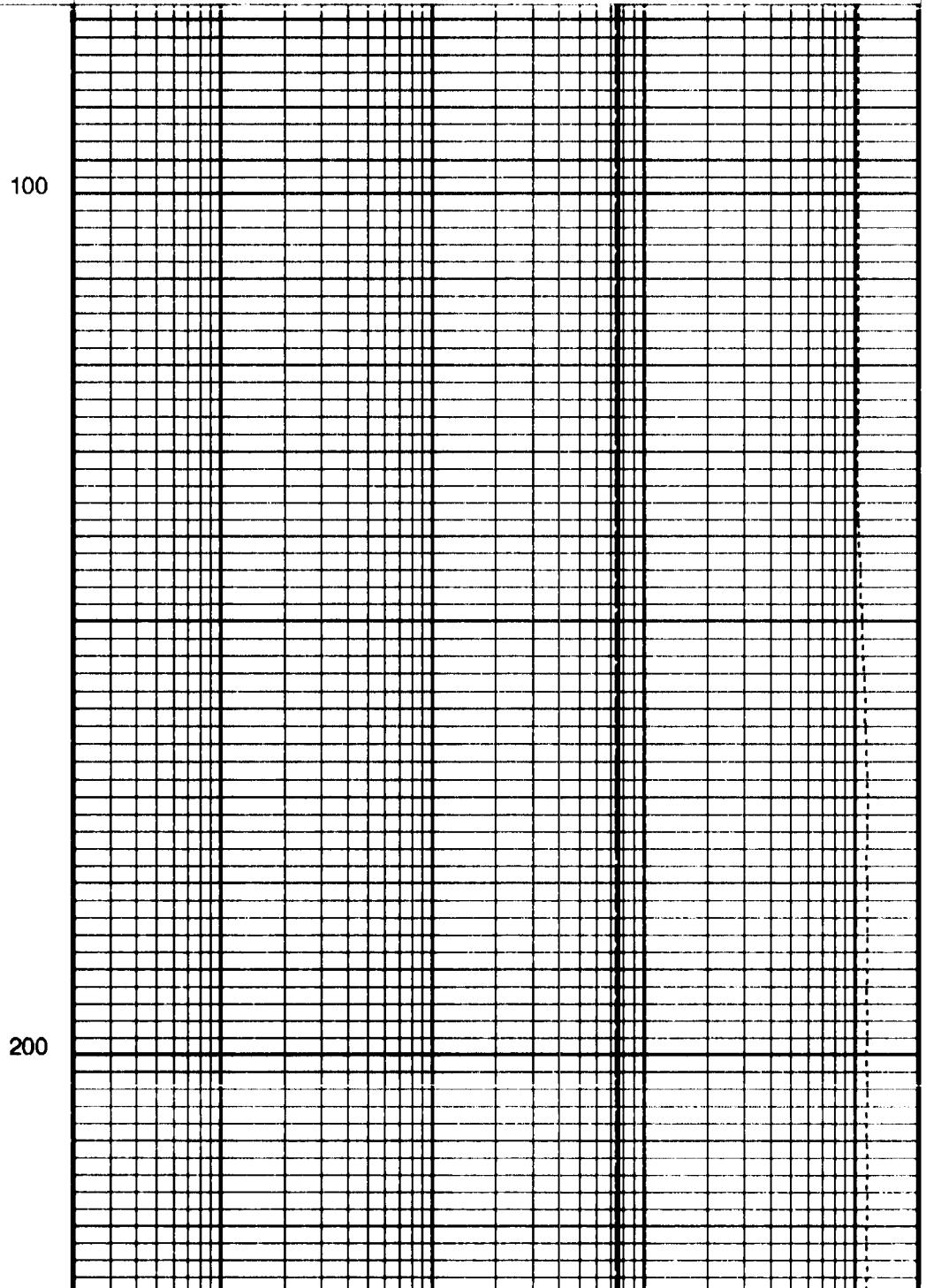
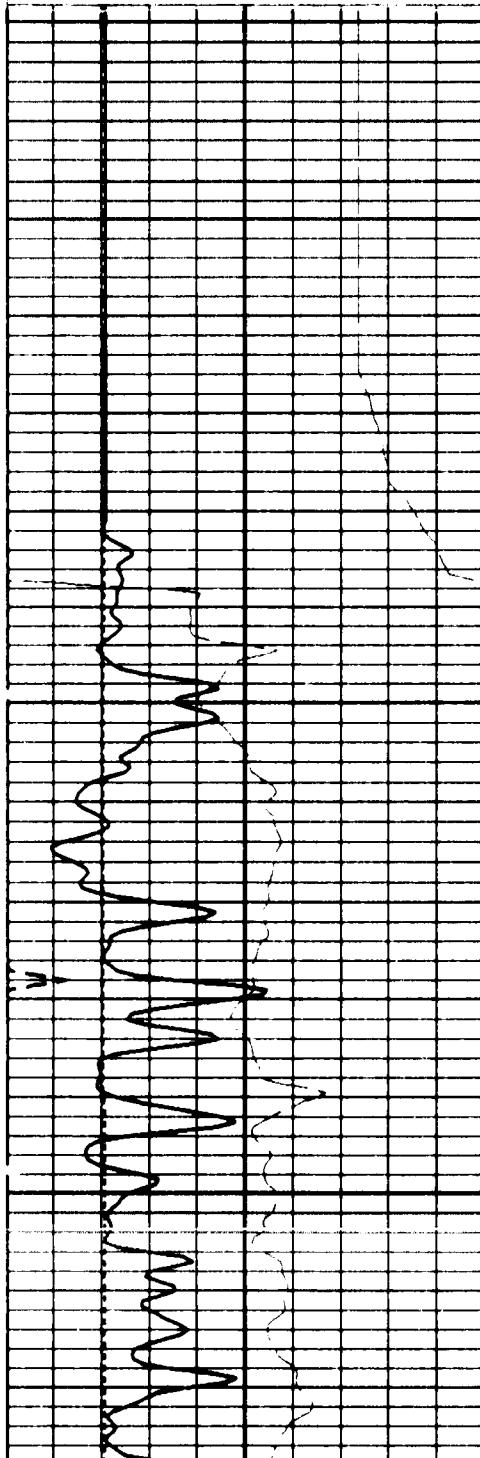
Tension (TENS)

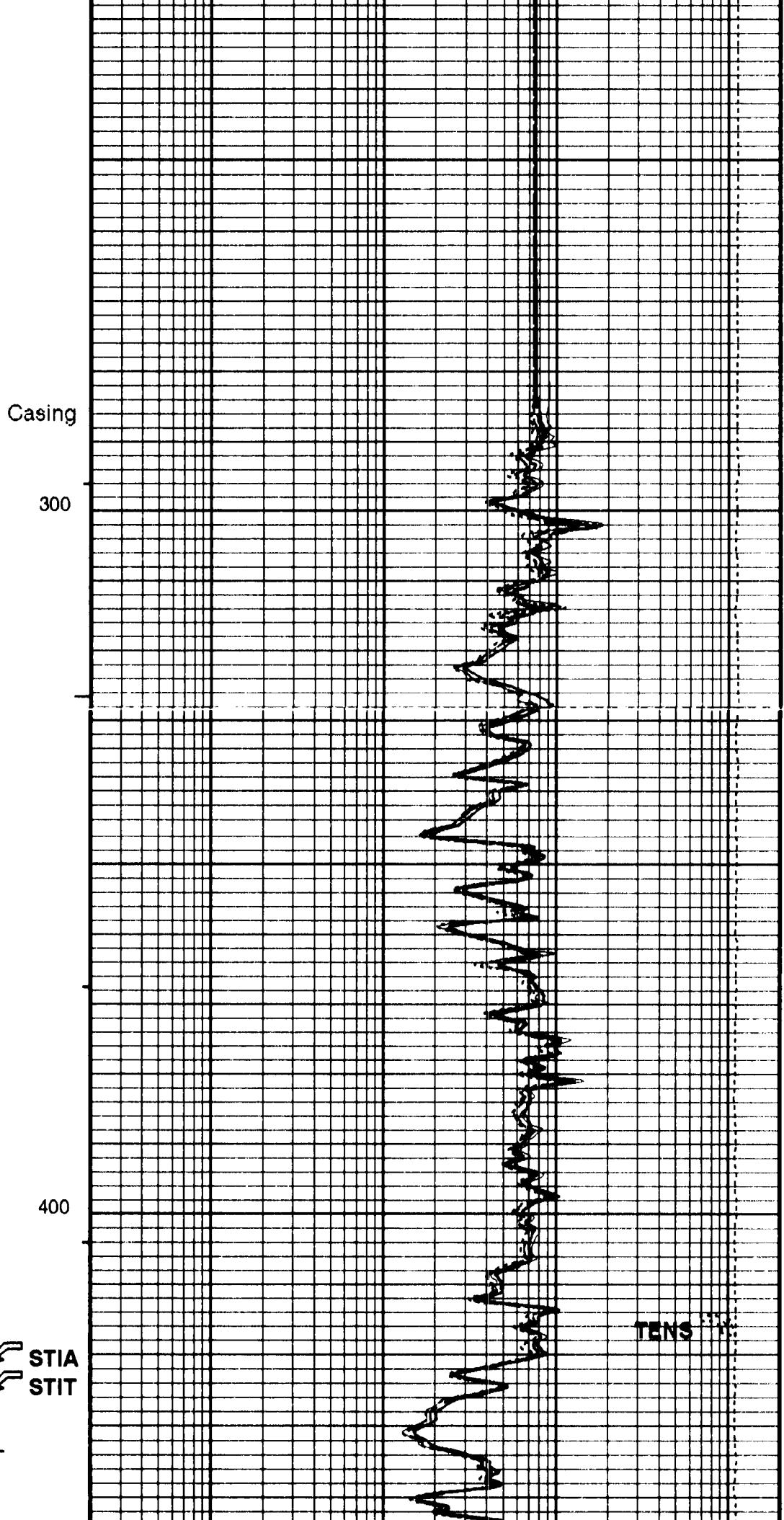
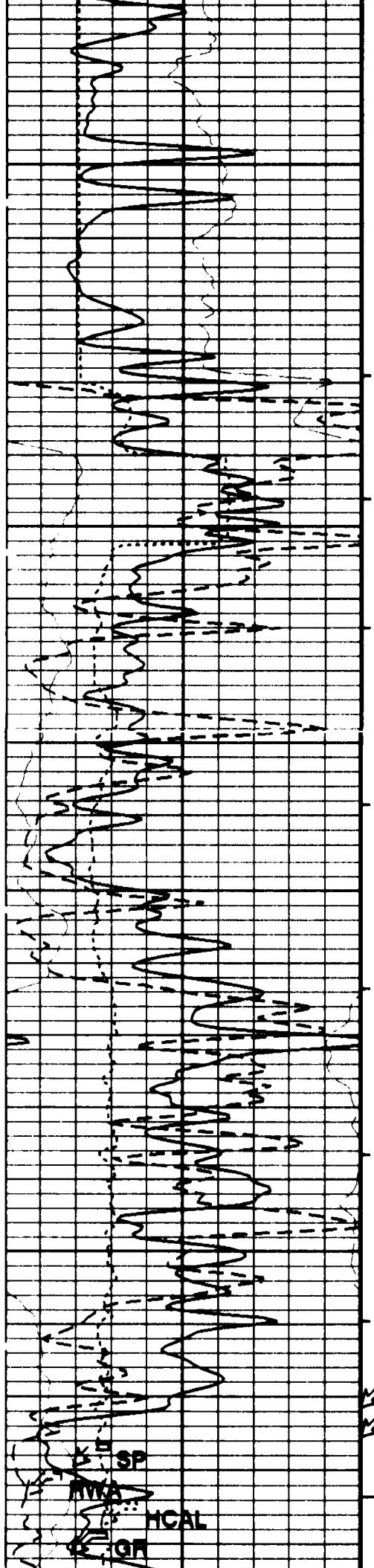
10000 (LBF) 0

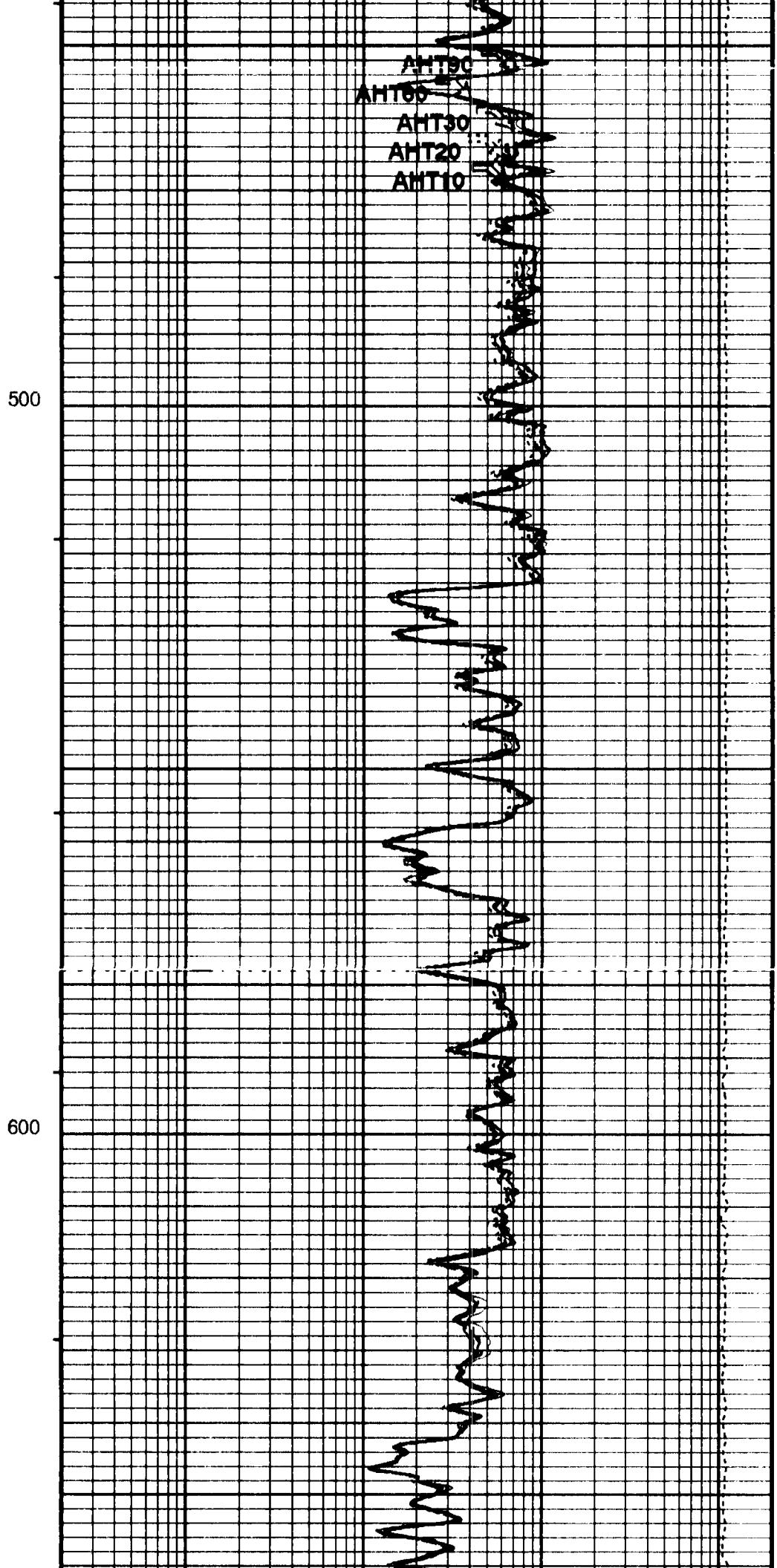
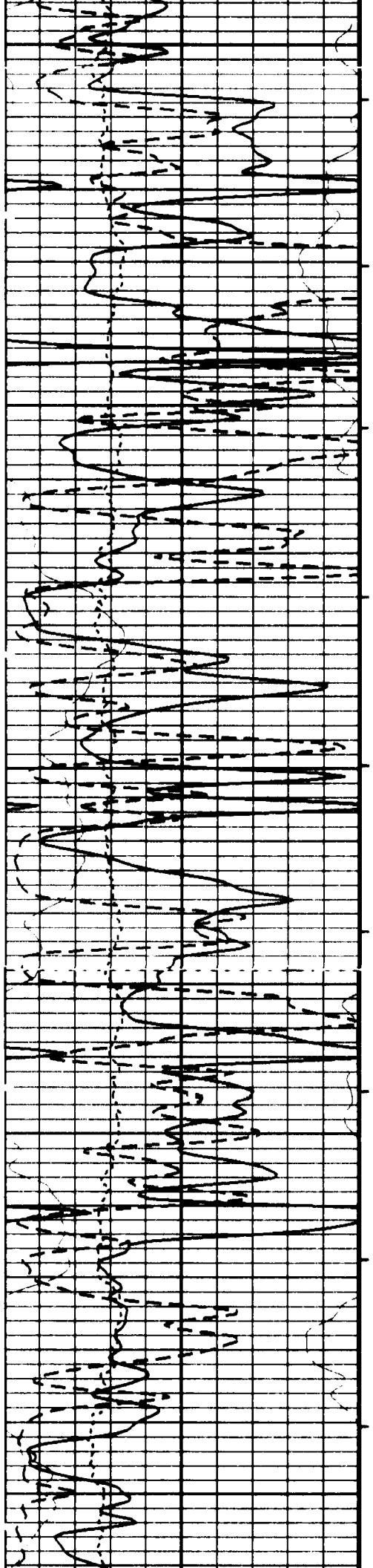
MAIN PASS

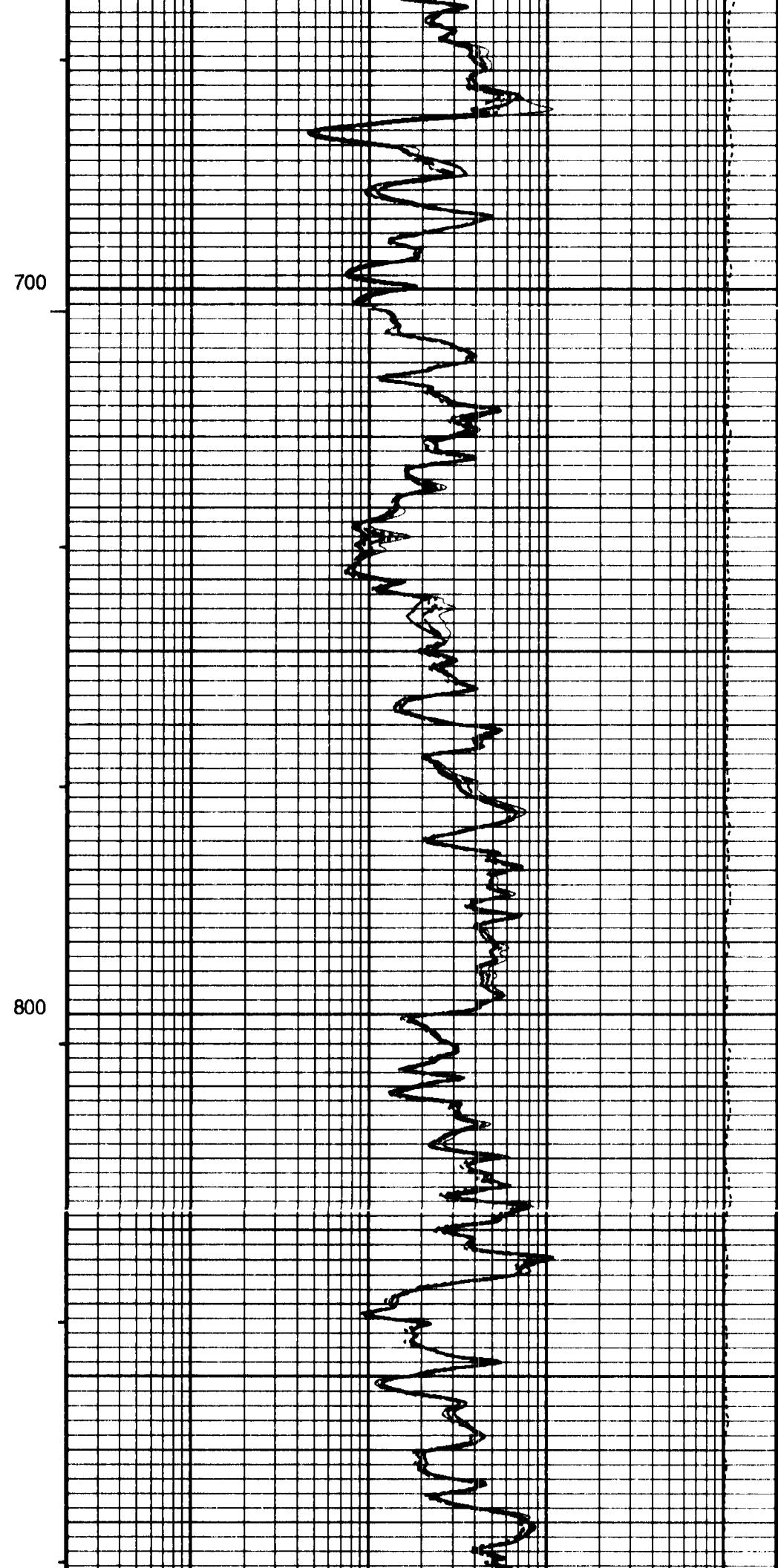
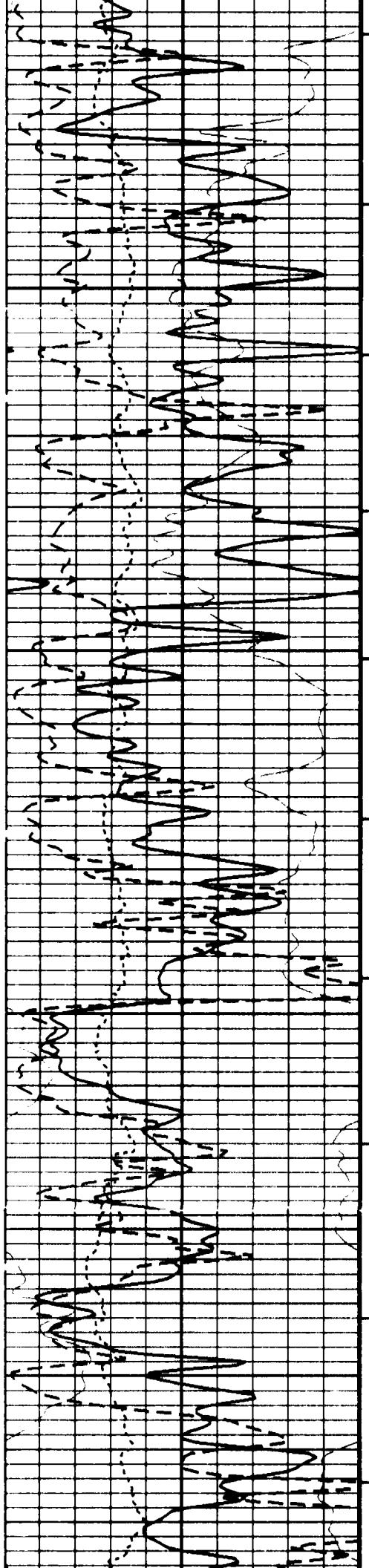
AIT-H 90 Inch Investigation (AHT90)			
0.2	(OHMM)	2000	
AIT-H 60 Inch Investigation (AHT60)			
0.2	(OHMM)	2000	
AIT-H 30 Inch Investigation (AHT30)			
0.2	(OHMM)	2000	
AIT-H 20 Inch Investigation (AHT20)			
0.2	(OHMM)	2000	
AIT-H 10 Inch Investigation (AHT10)			
0.2	(OHMM)	2000	

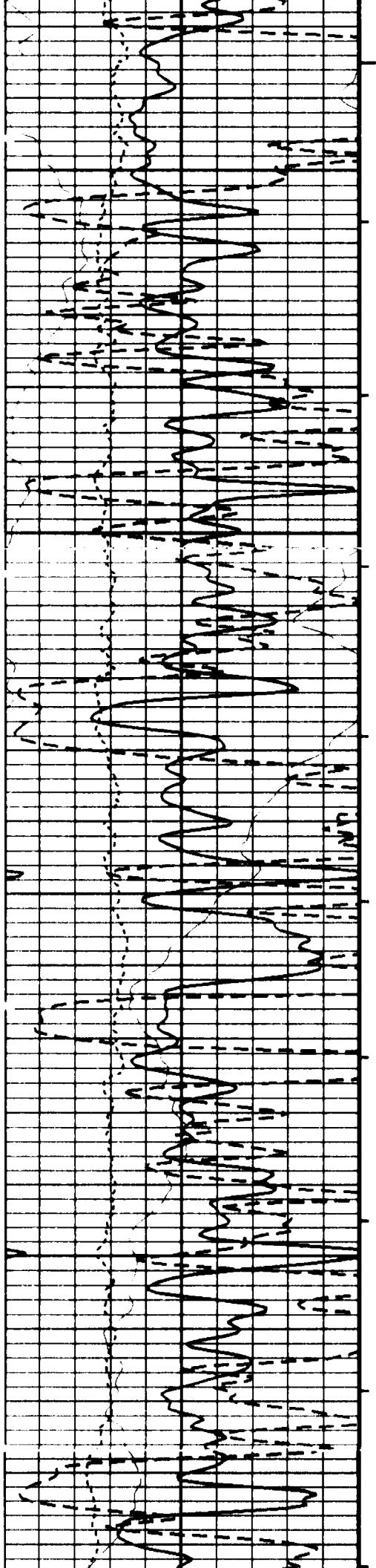
RWA (RWA) 0	(OHMM)	3	
Caliper (HCAL) 6	(IN)	16	Tool/Tot. Drag From D3T to STIA
Gamma Ray (GR) 0	(GAPI)	200	Cable Drag From STIA to STIT
SP (SP) -80	(MV)	20	Stuck Stretch (STIT) 0 (F) 50





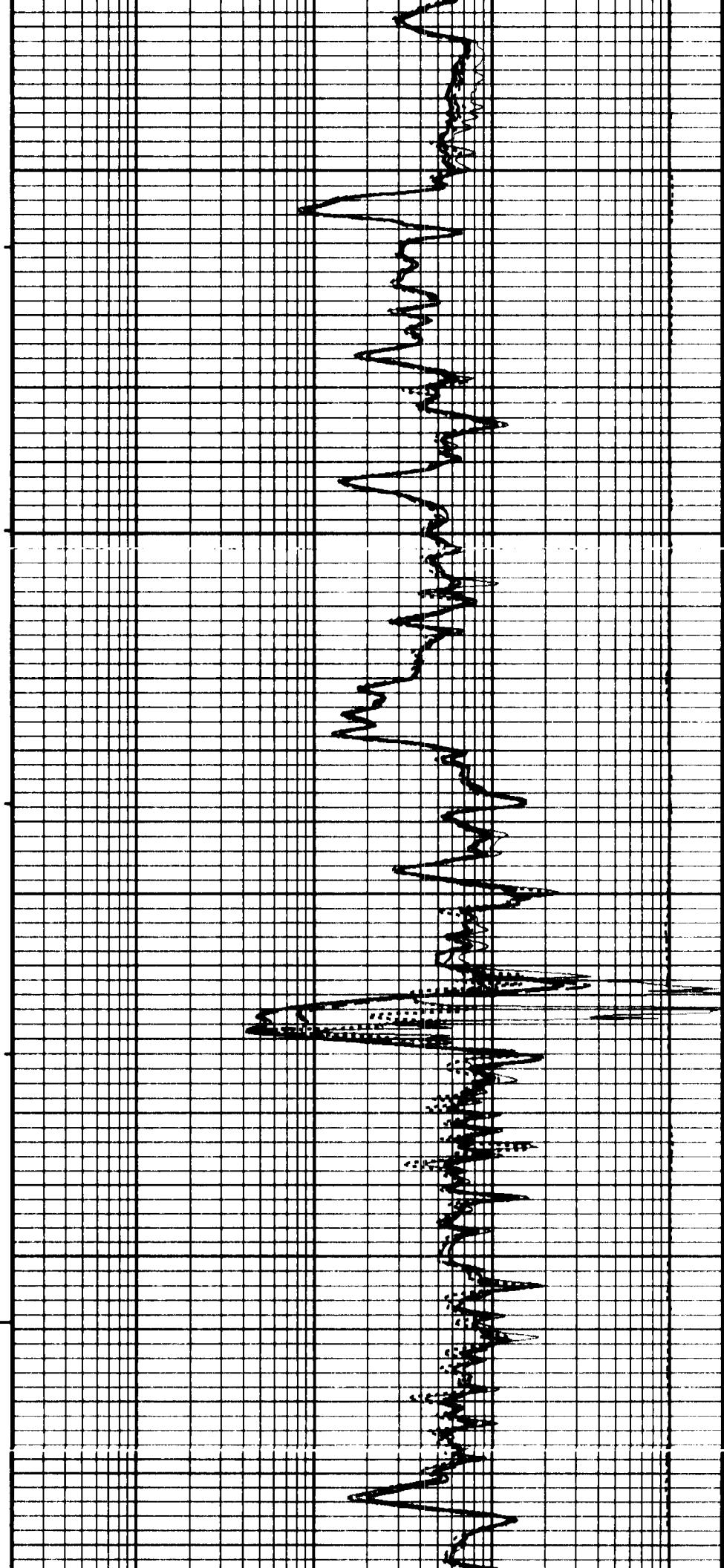


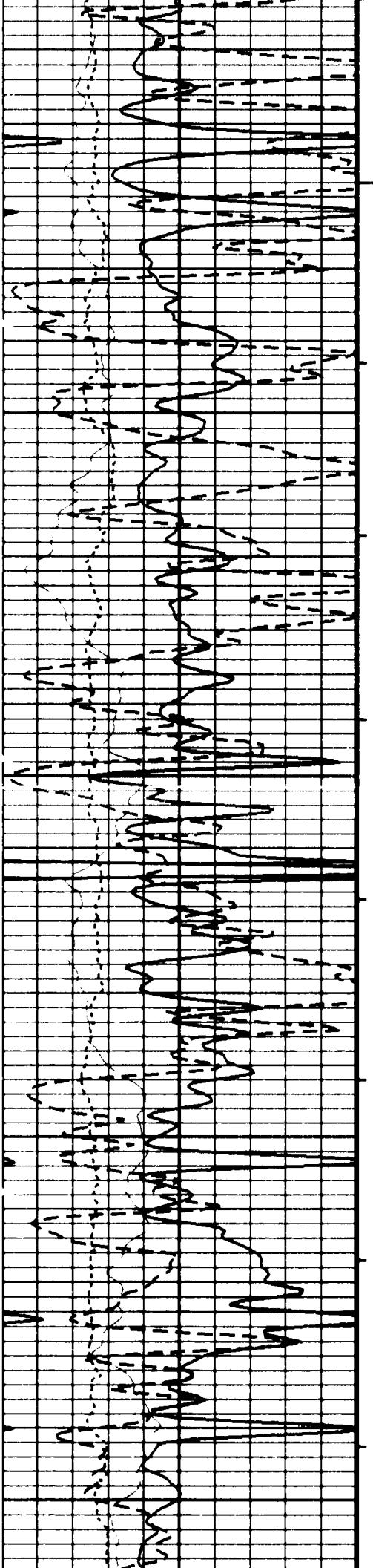




900

1000

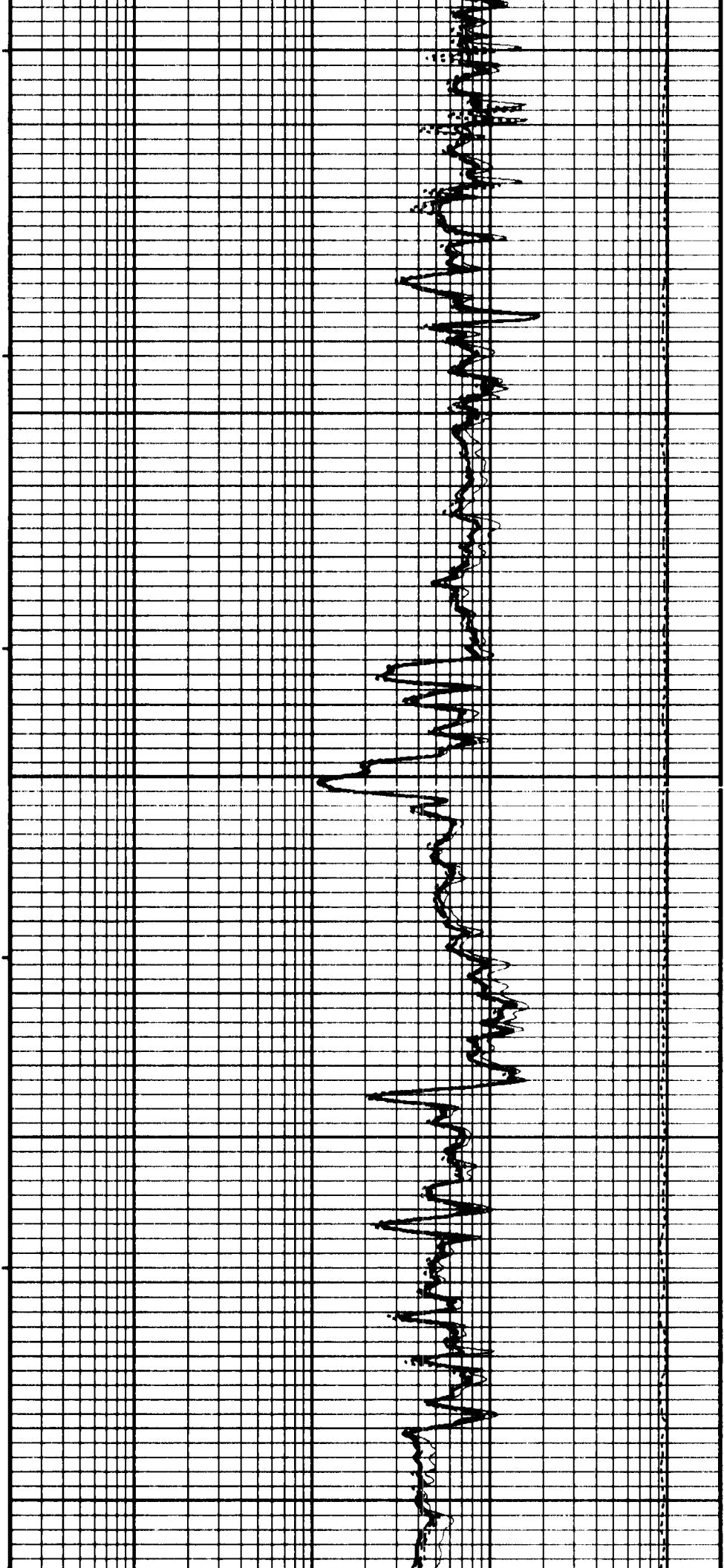


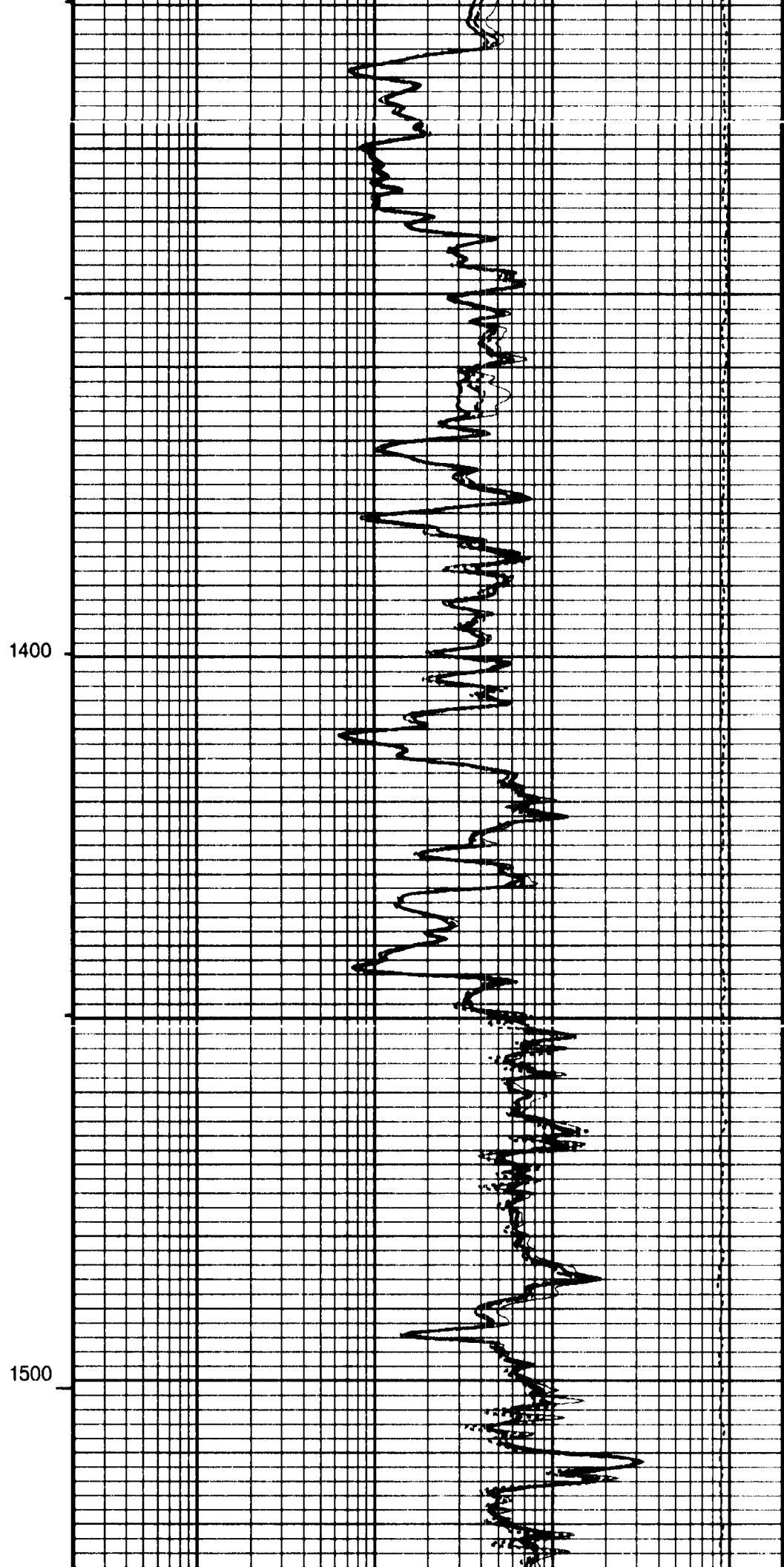
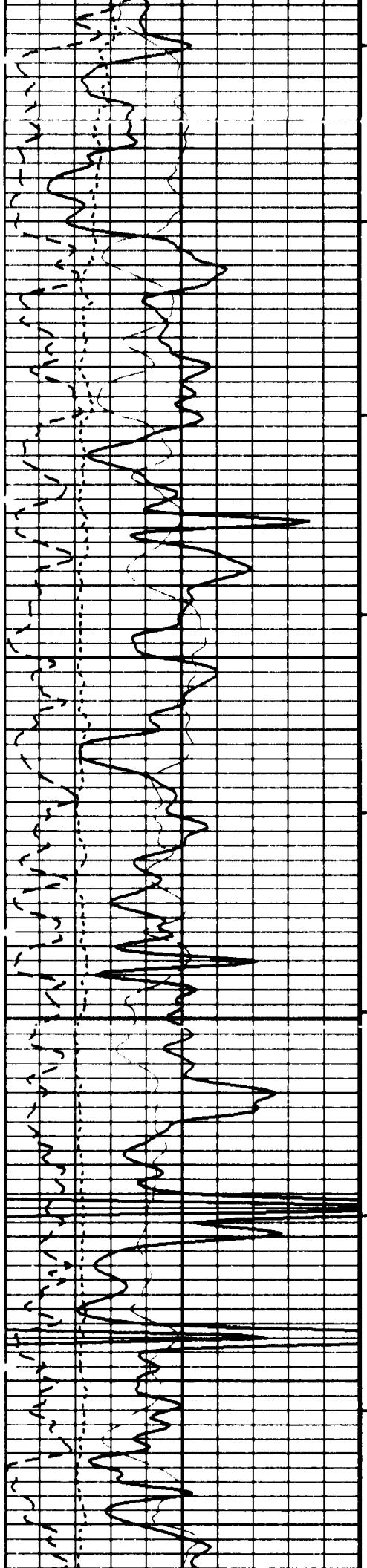


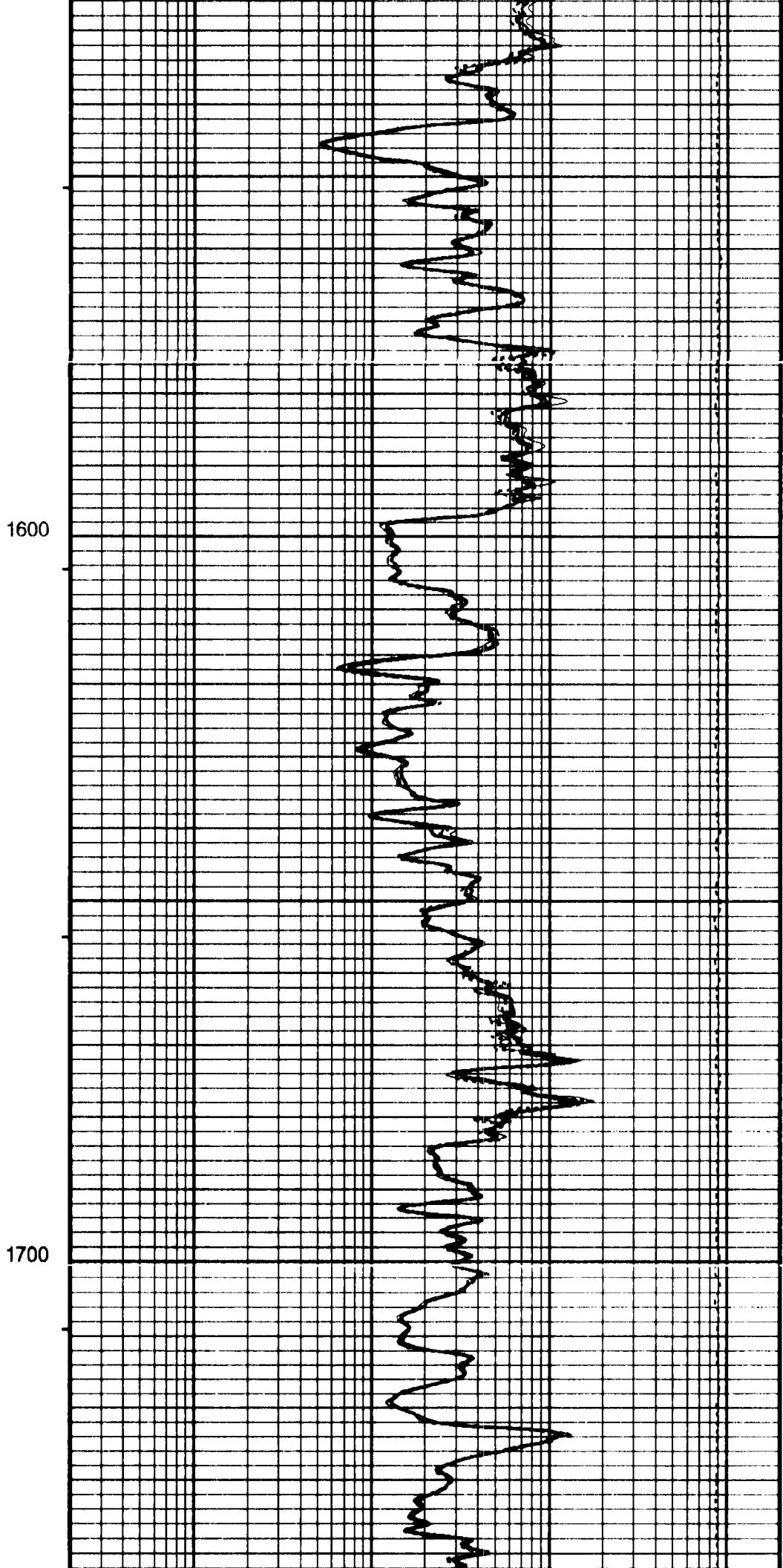
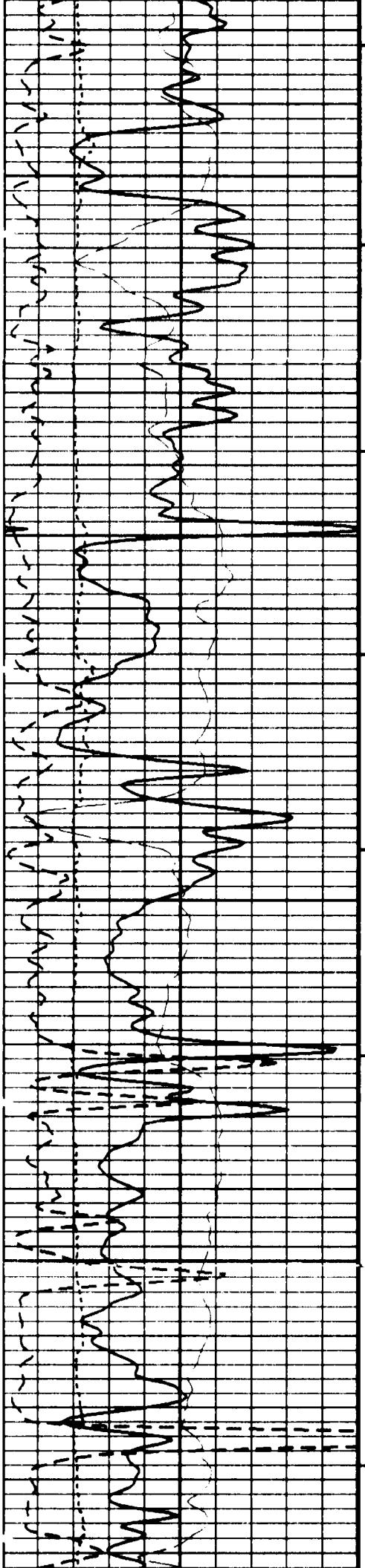
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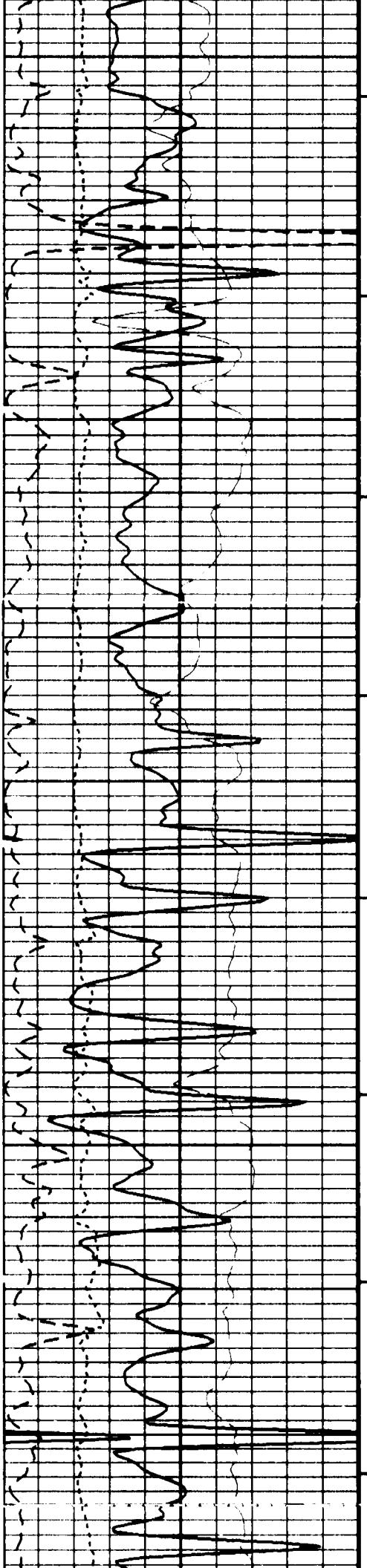
1200

1300



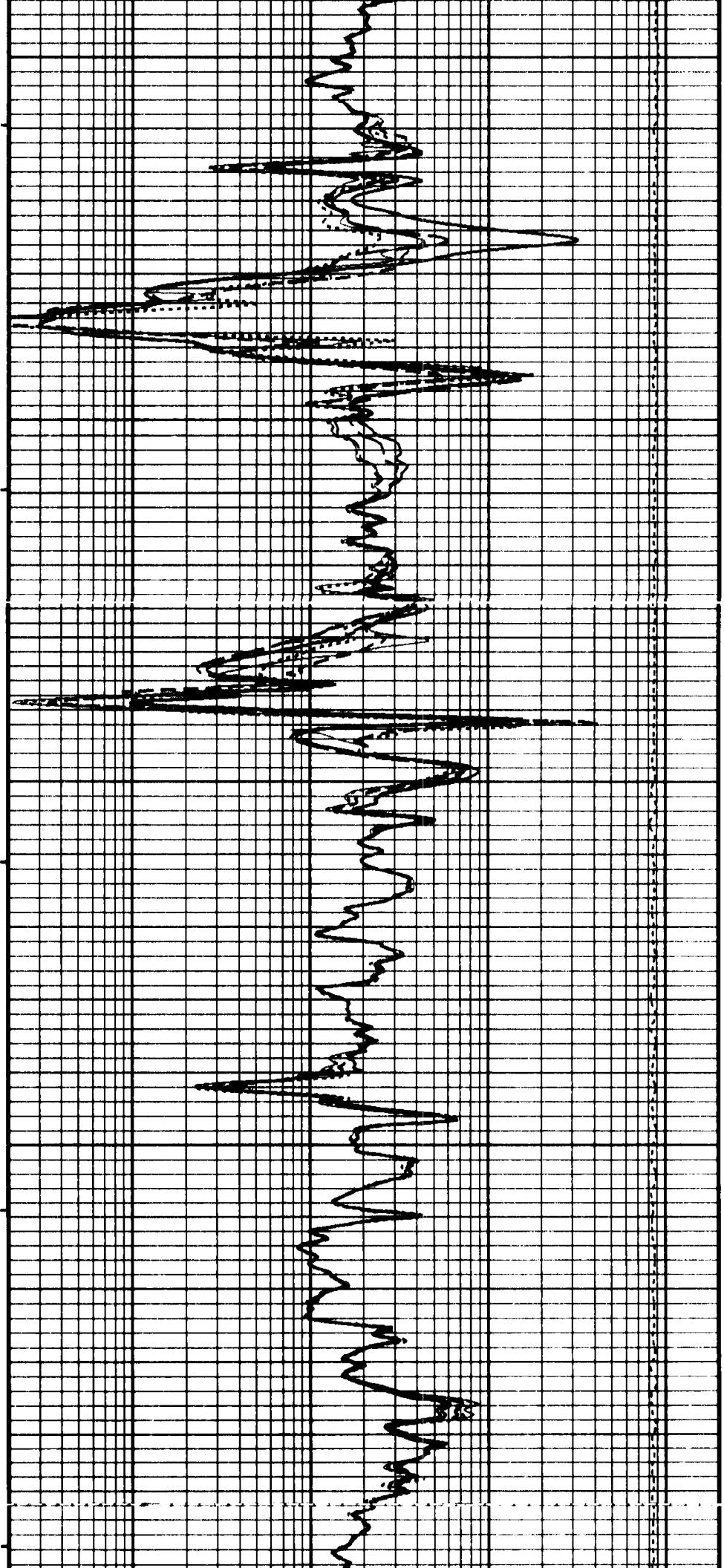


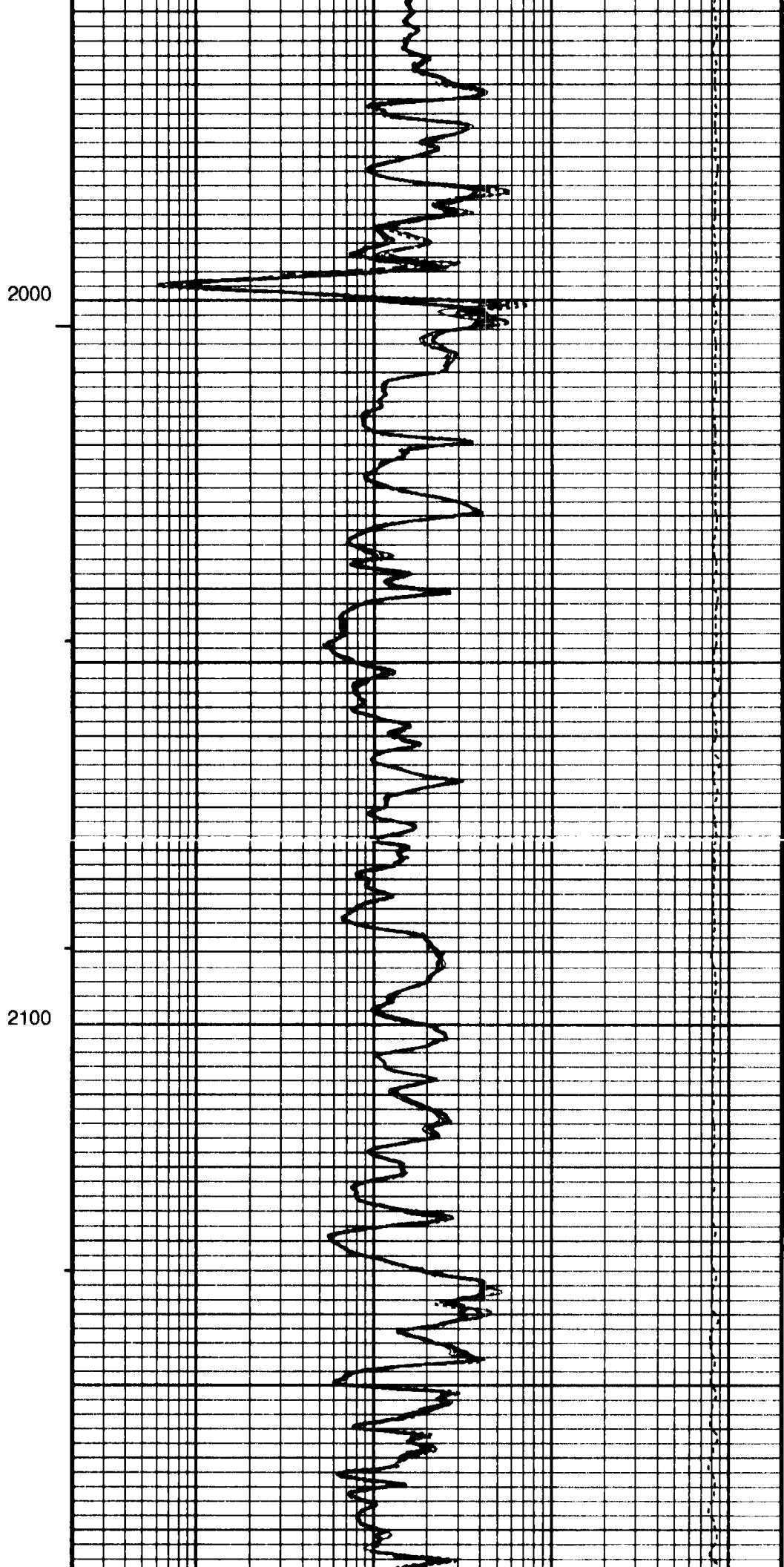
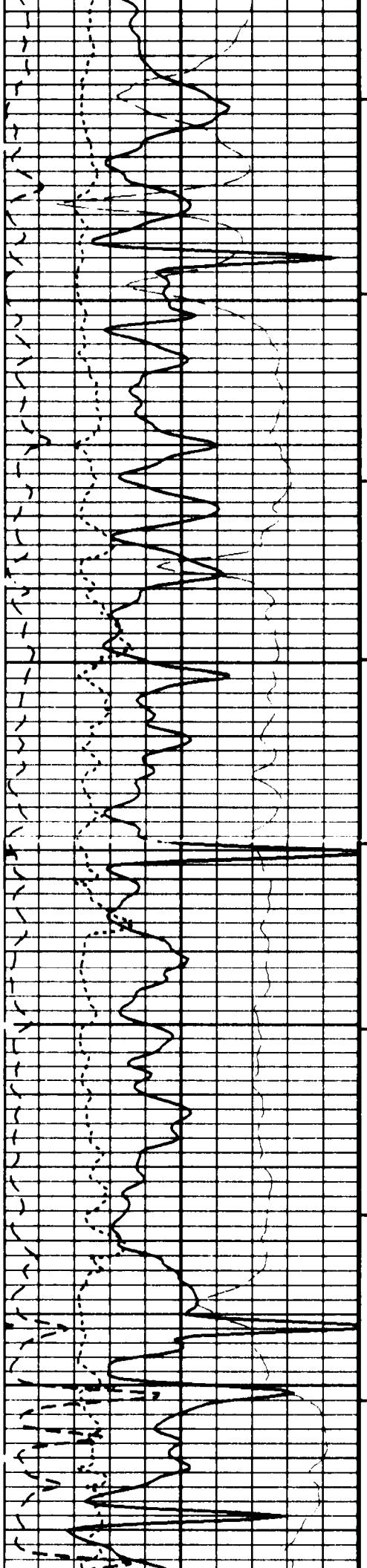




1800

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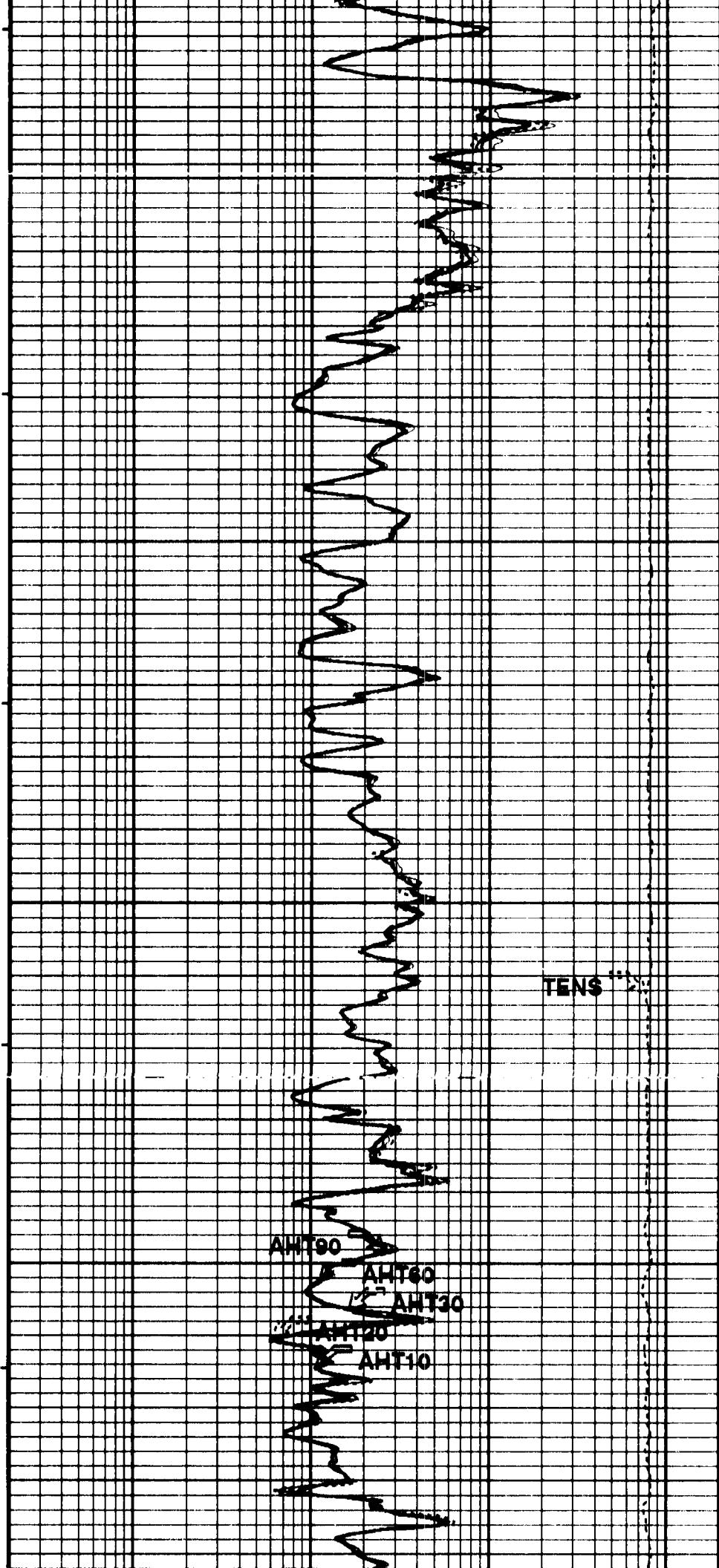


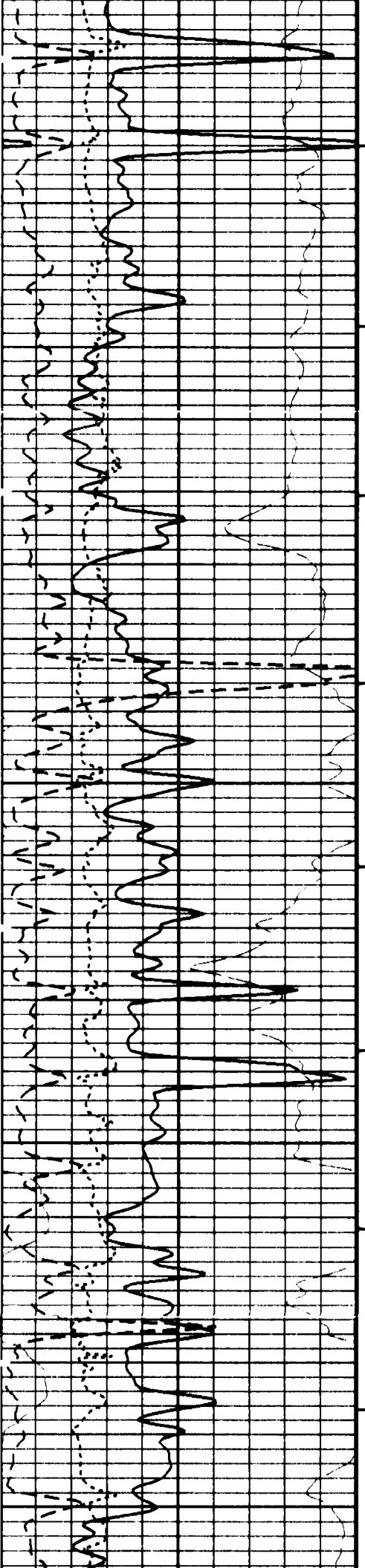




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2300

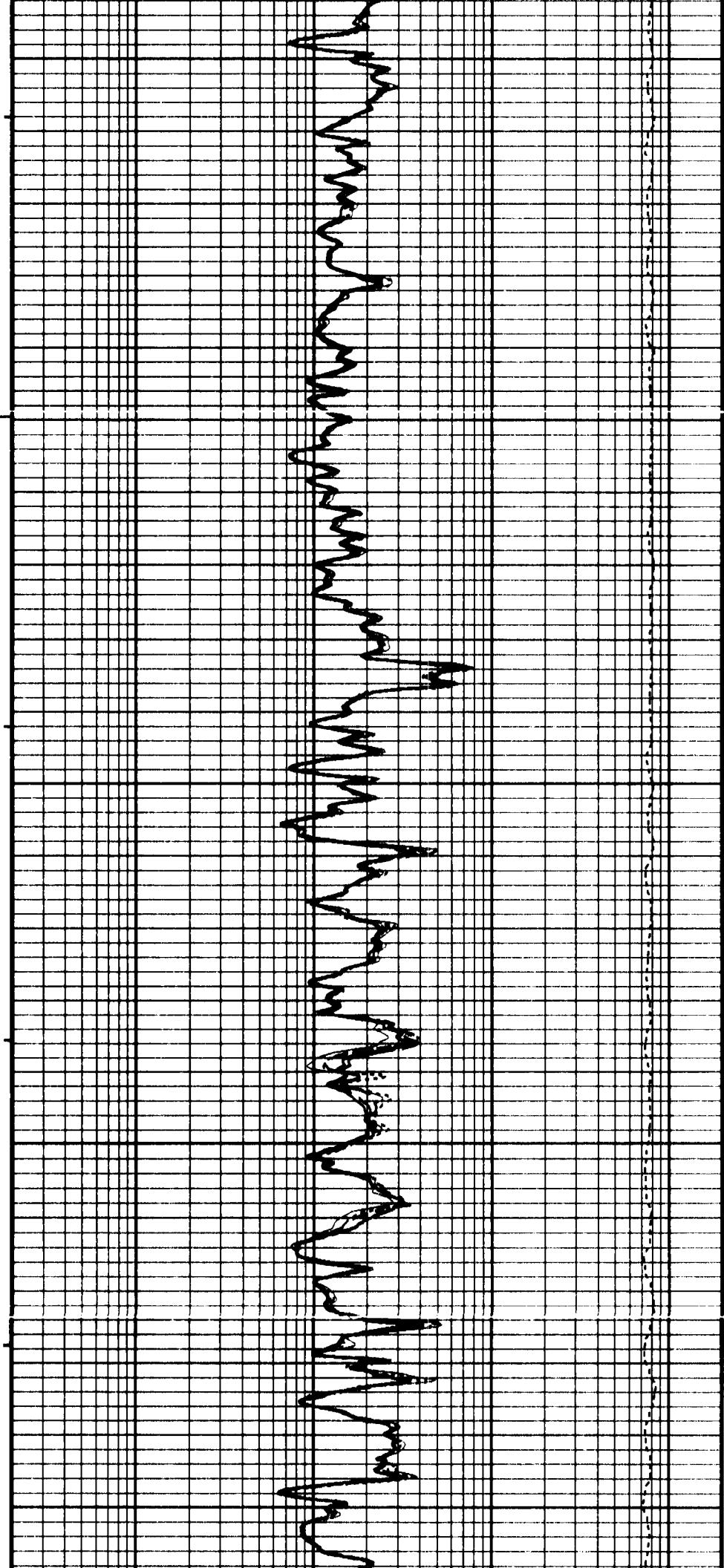
STIA
STIT

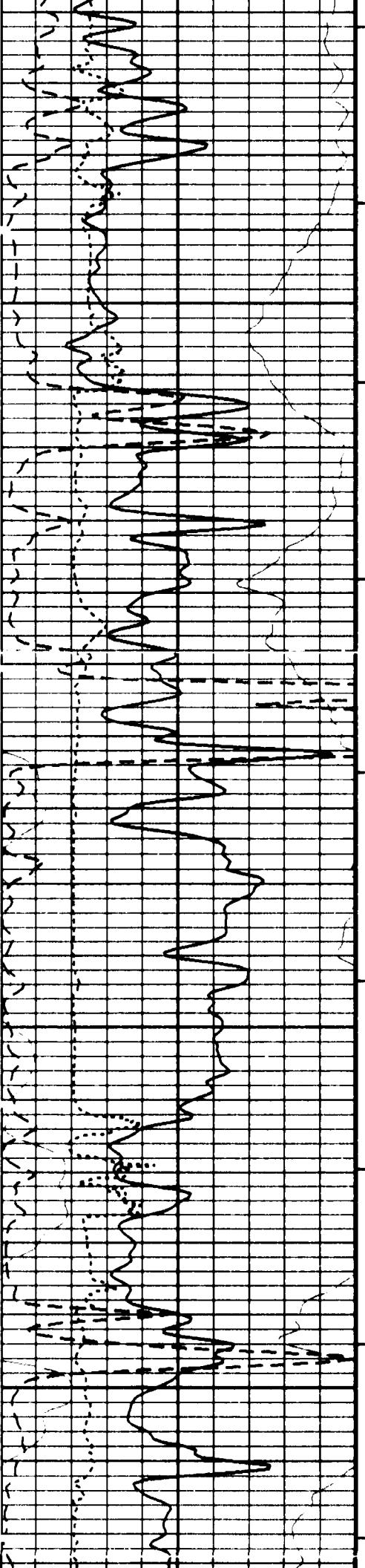


2400

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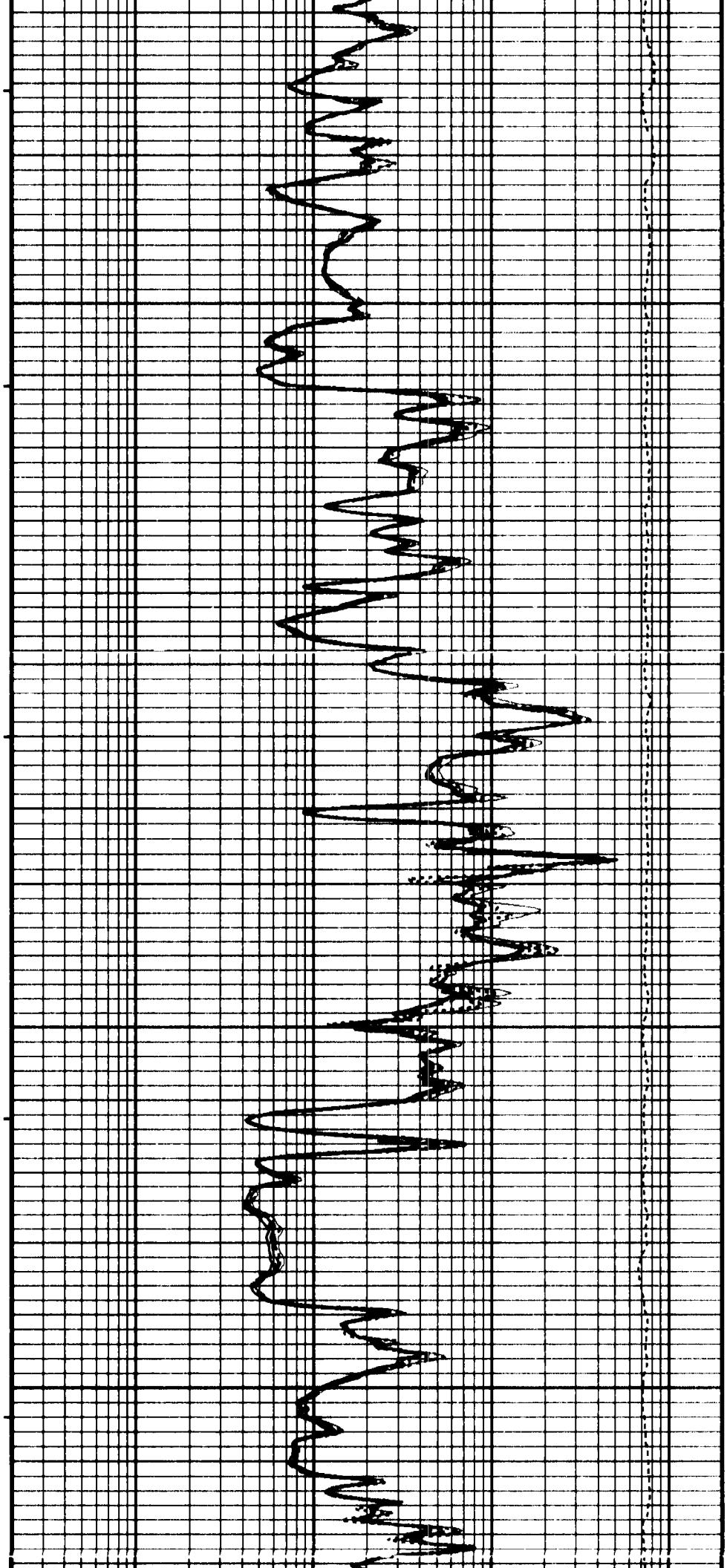
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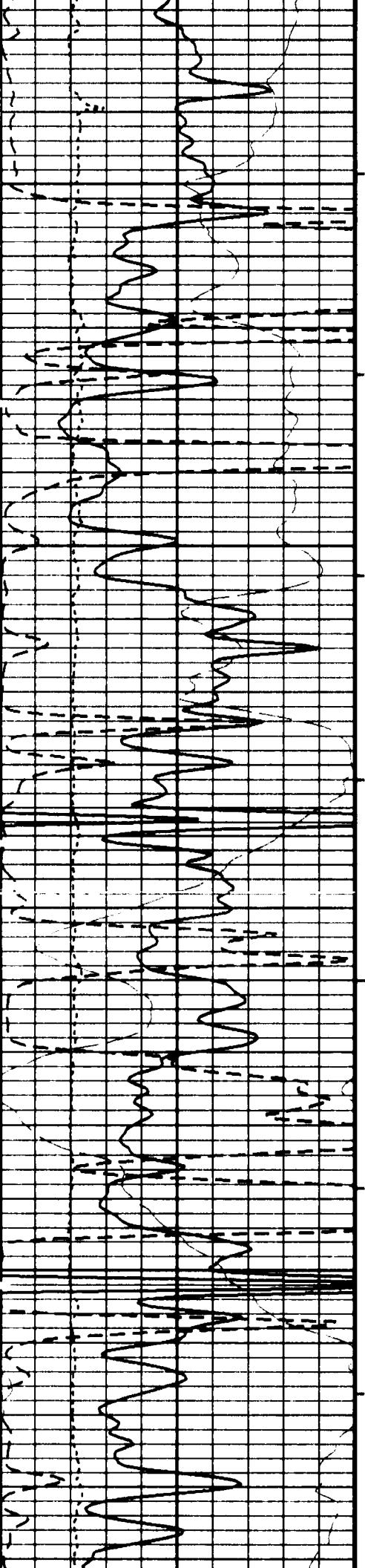




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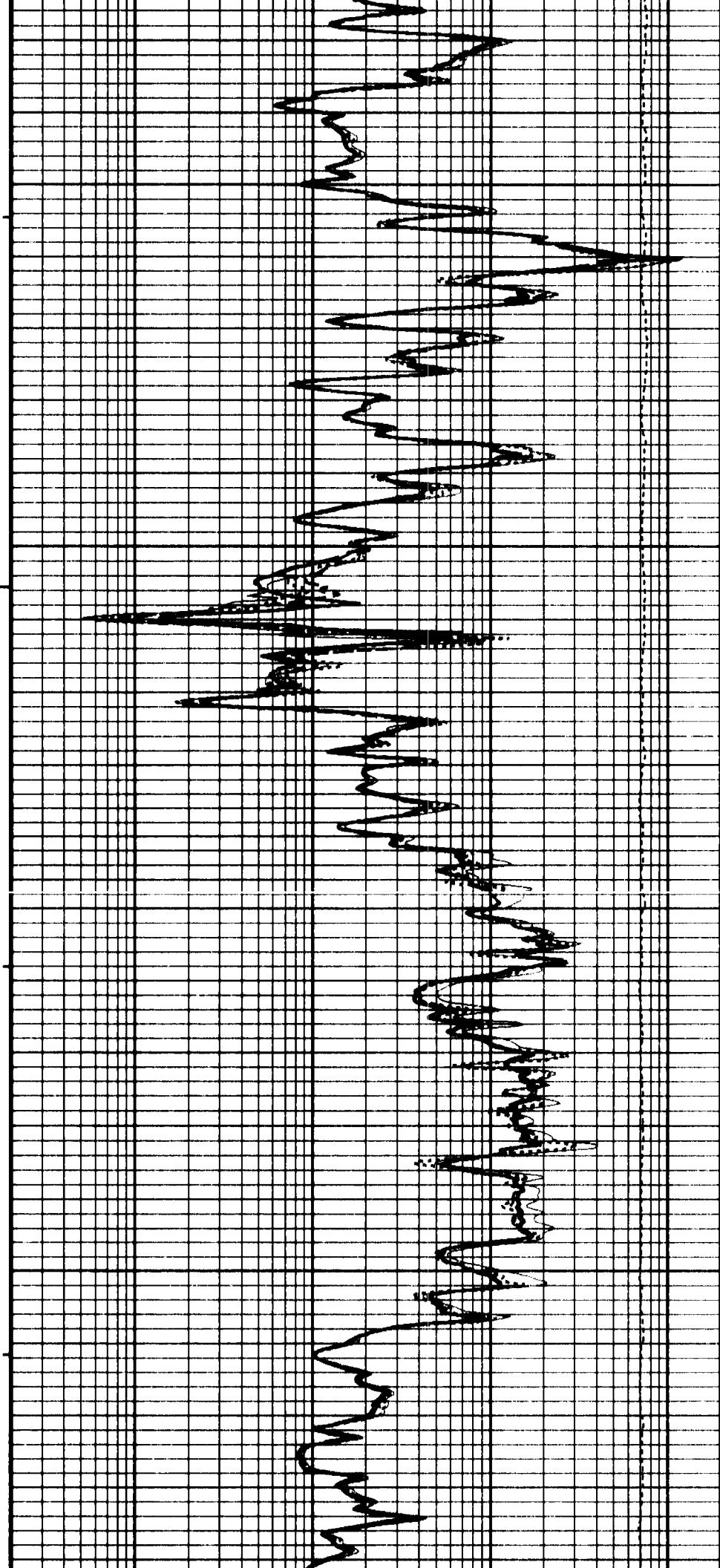
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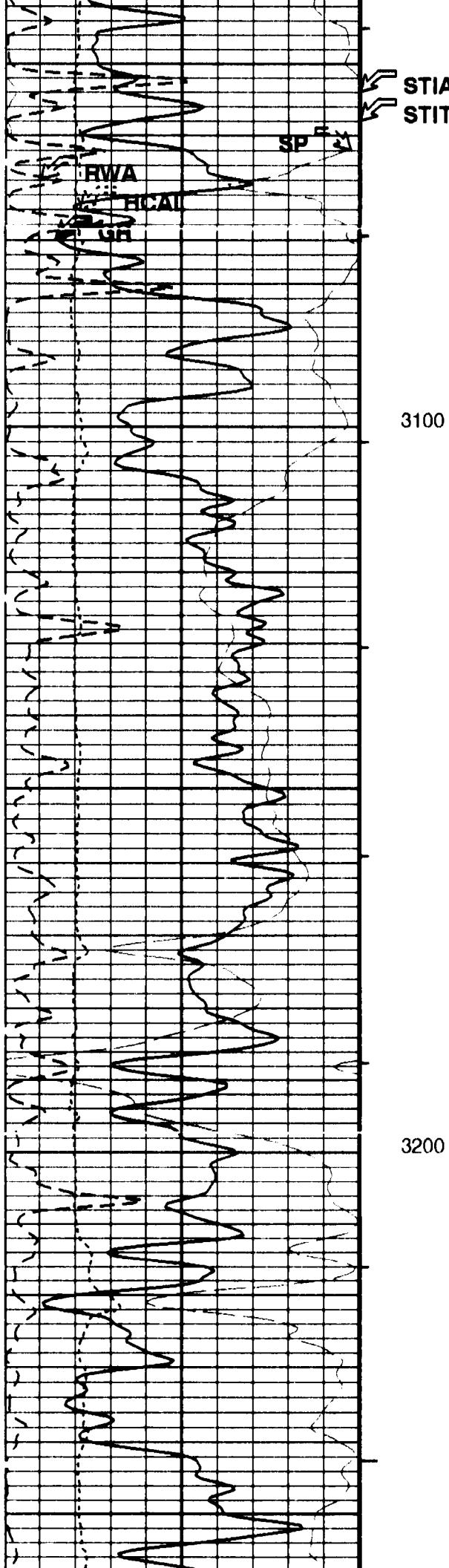




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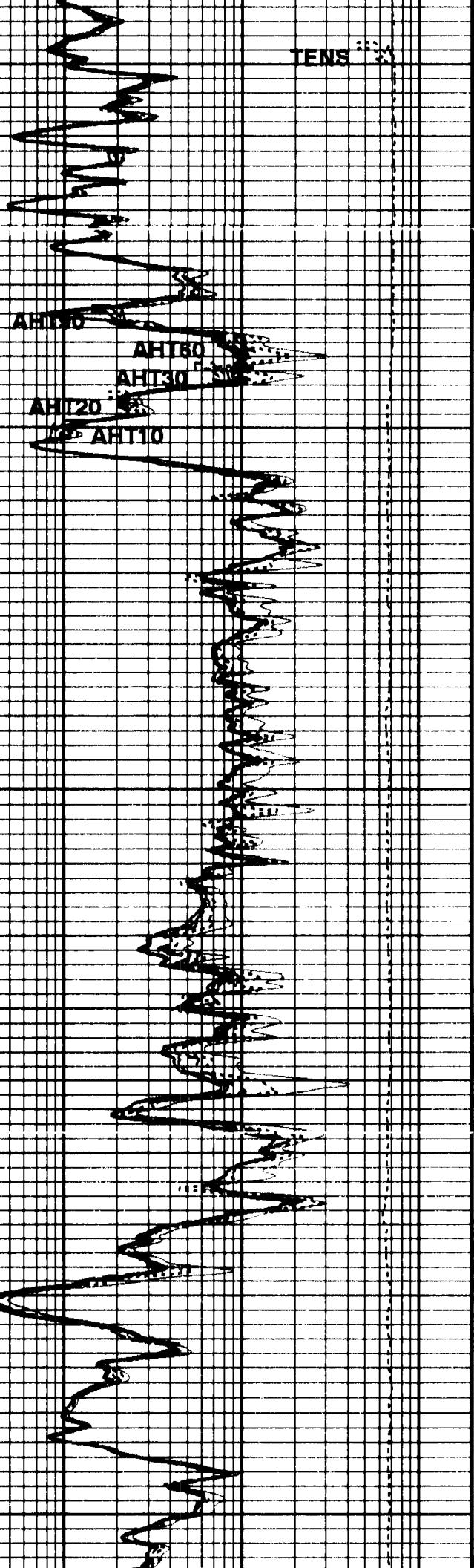
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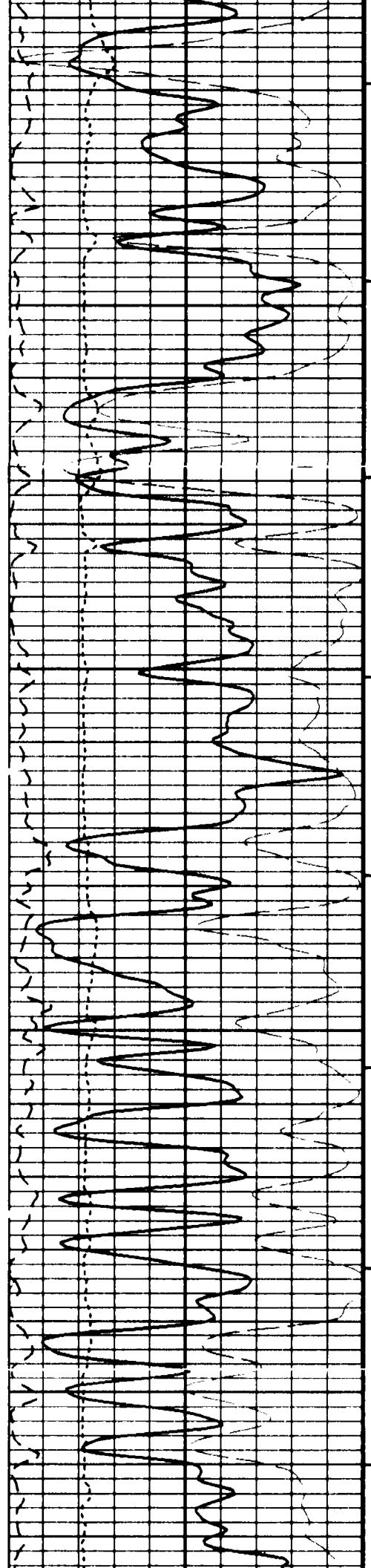


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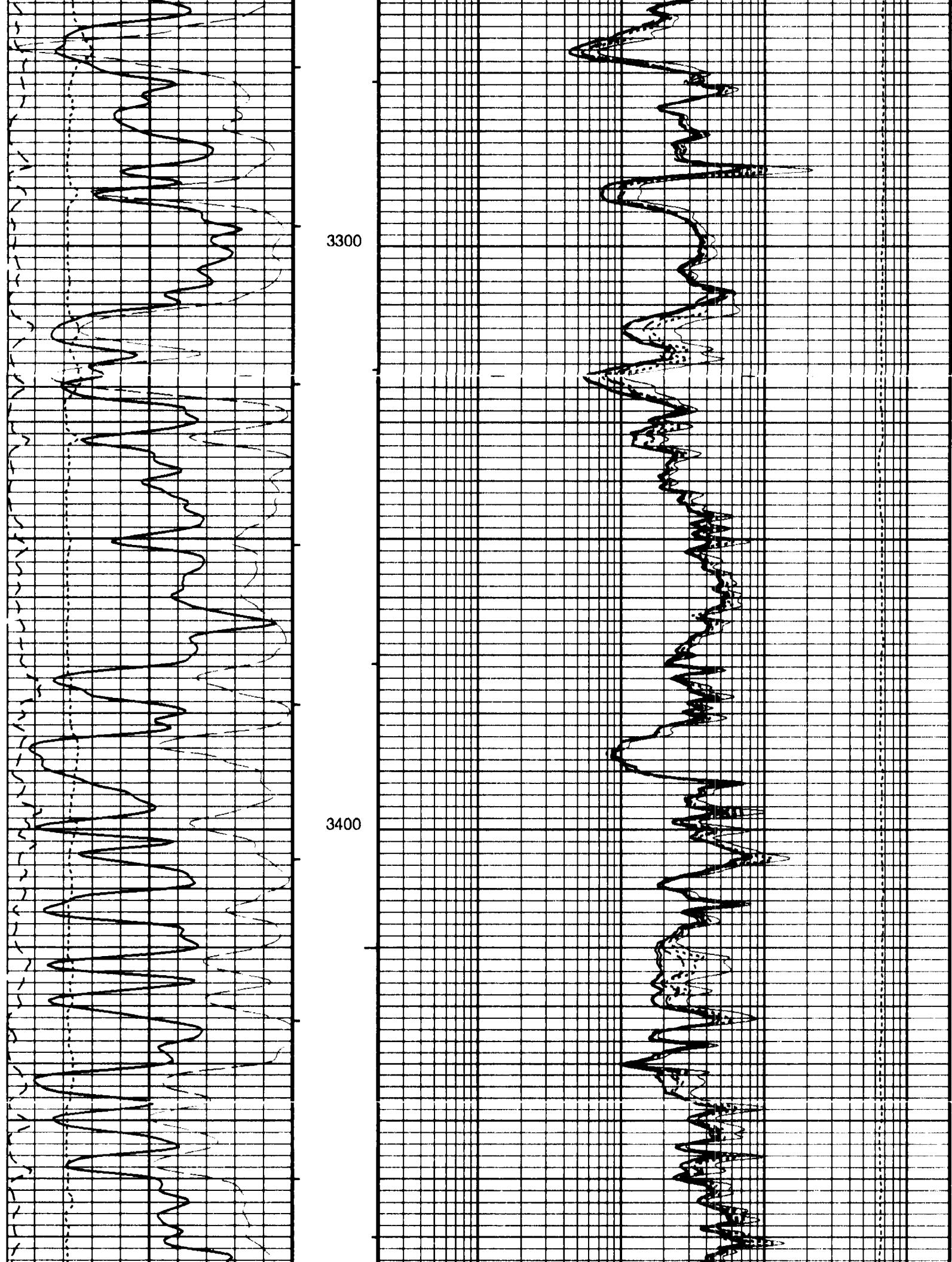
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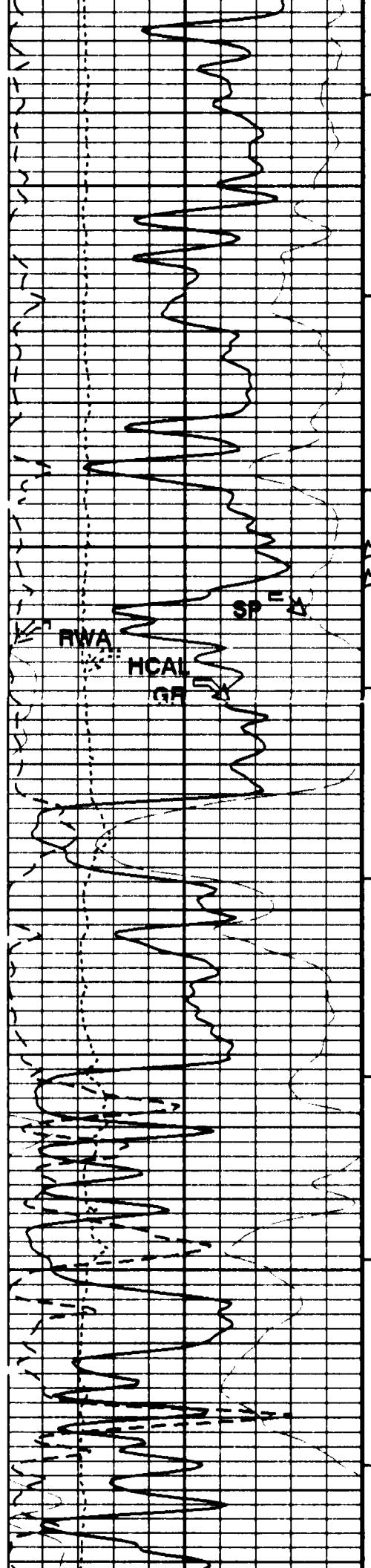
TENS



3300



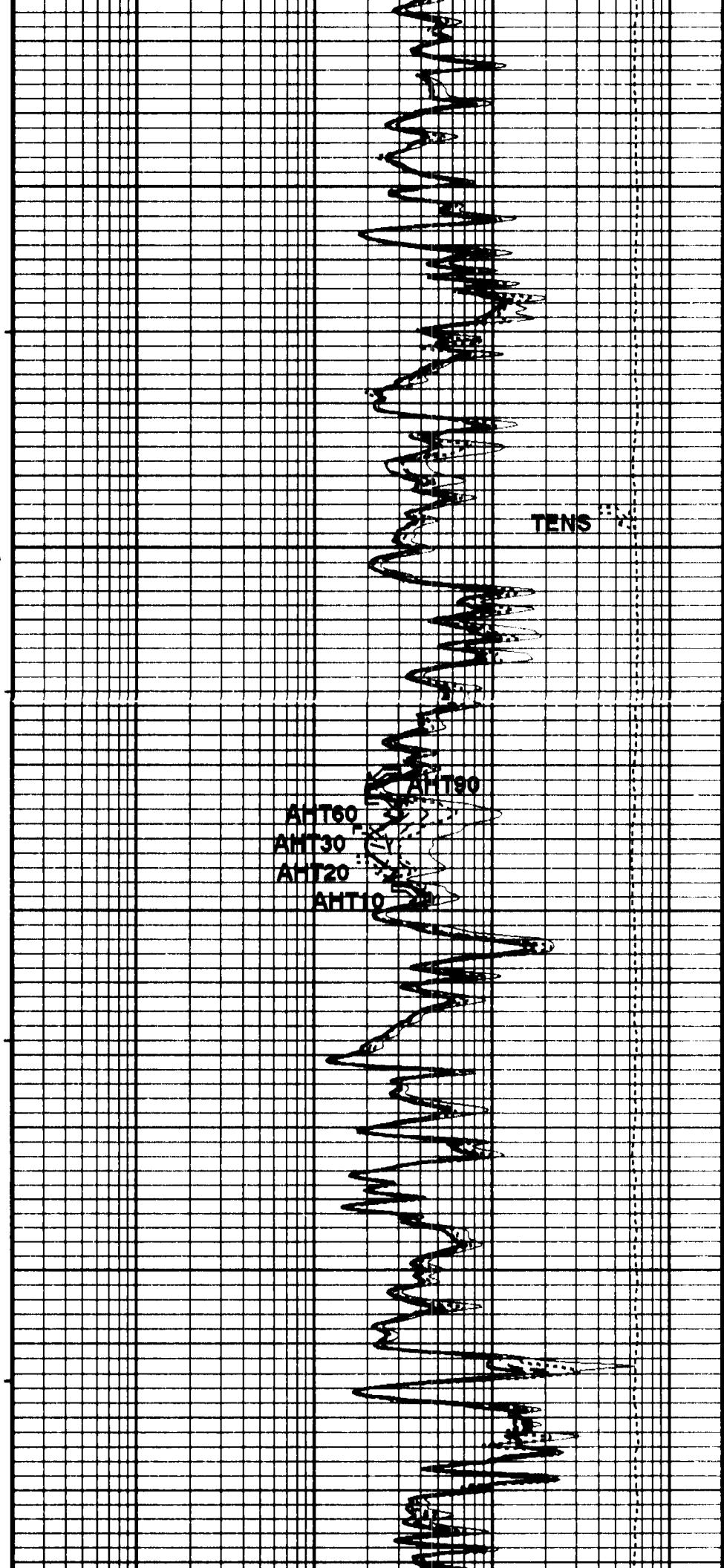
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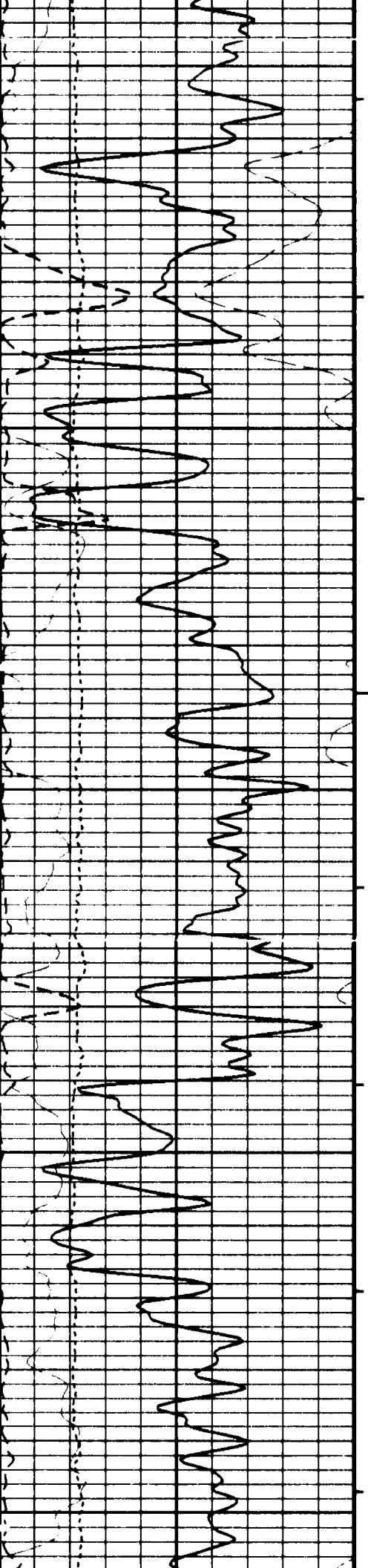
3500

STIA
STIT

3600

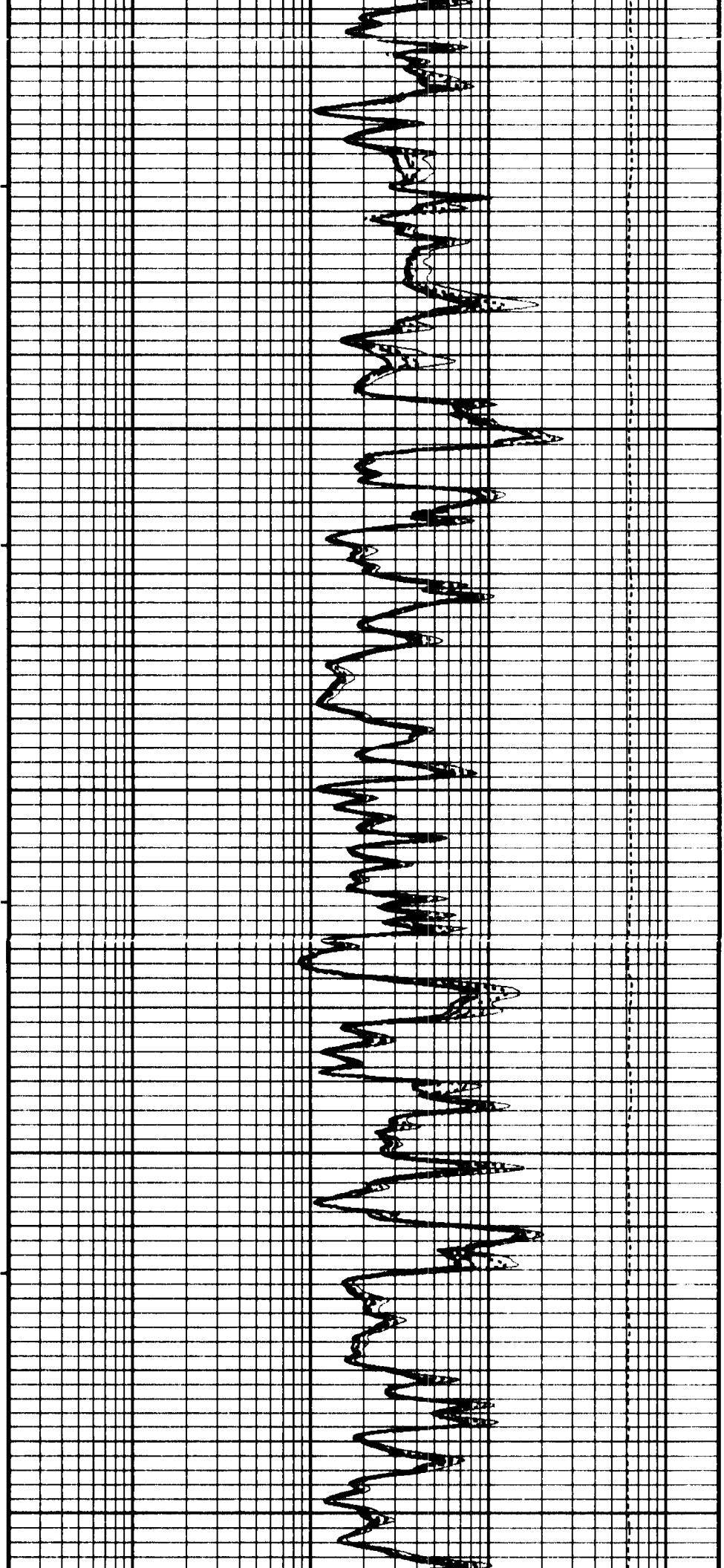


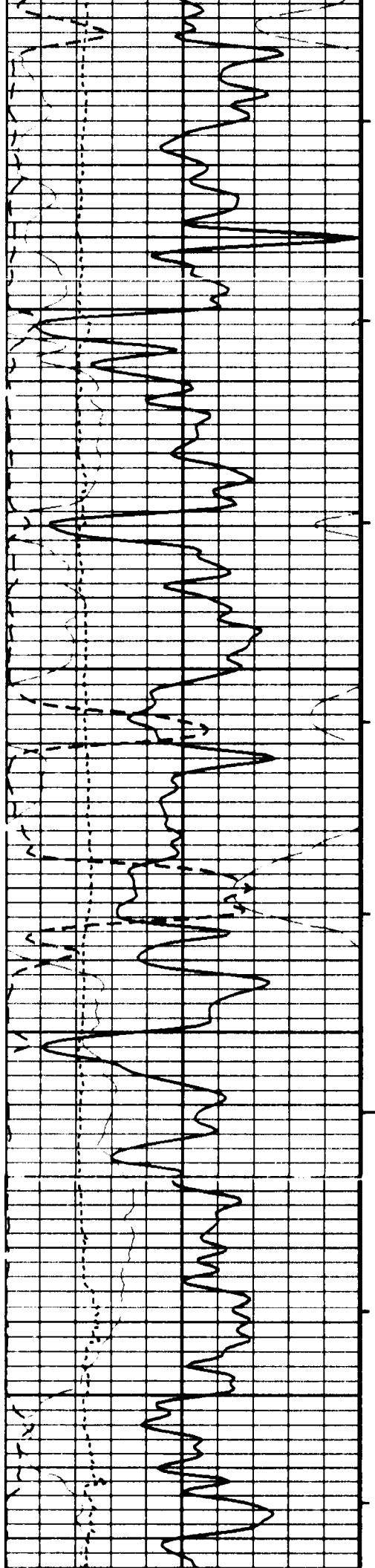
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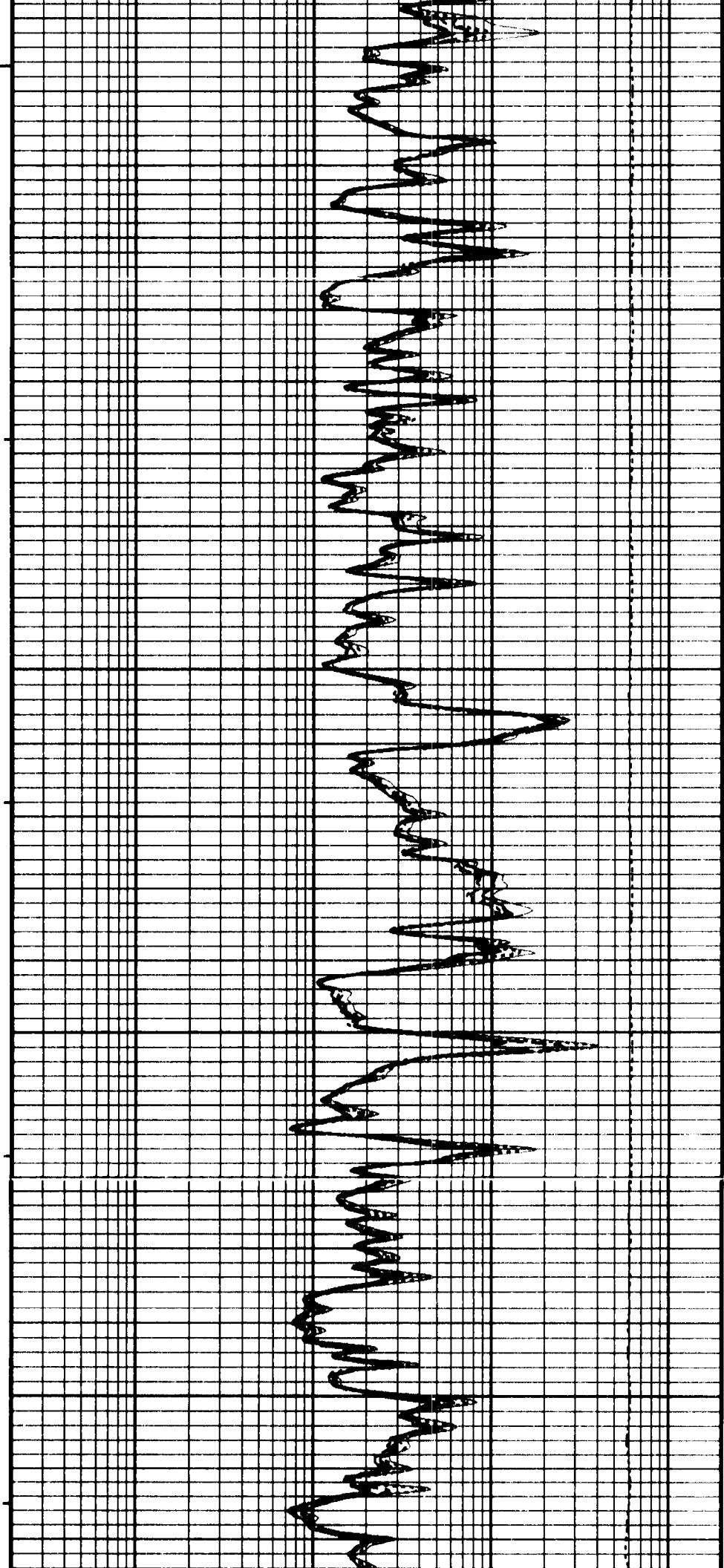
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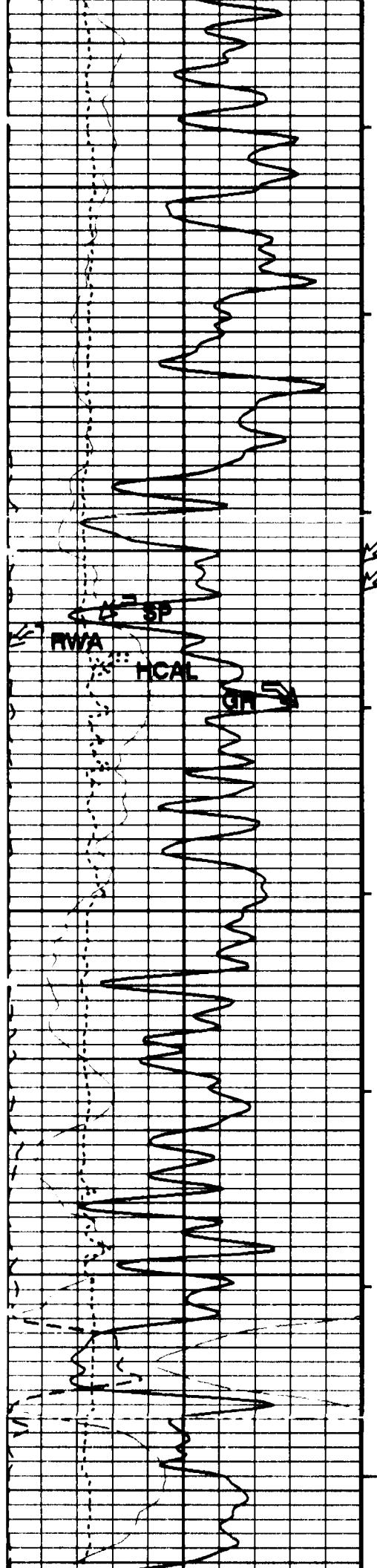




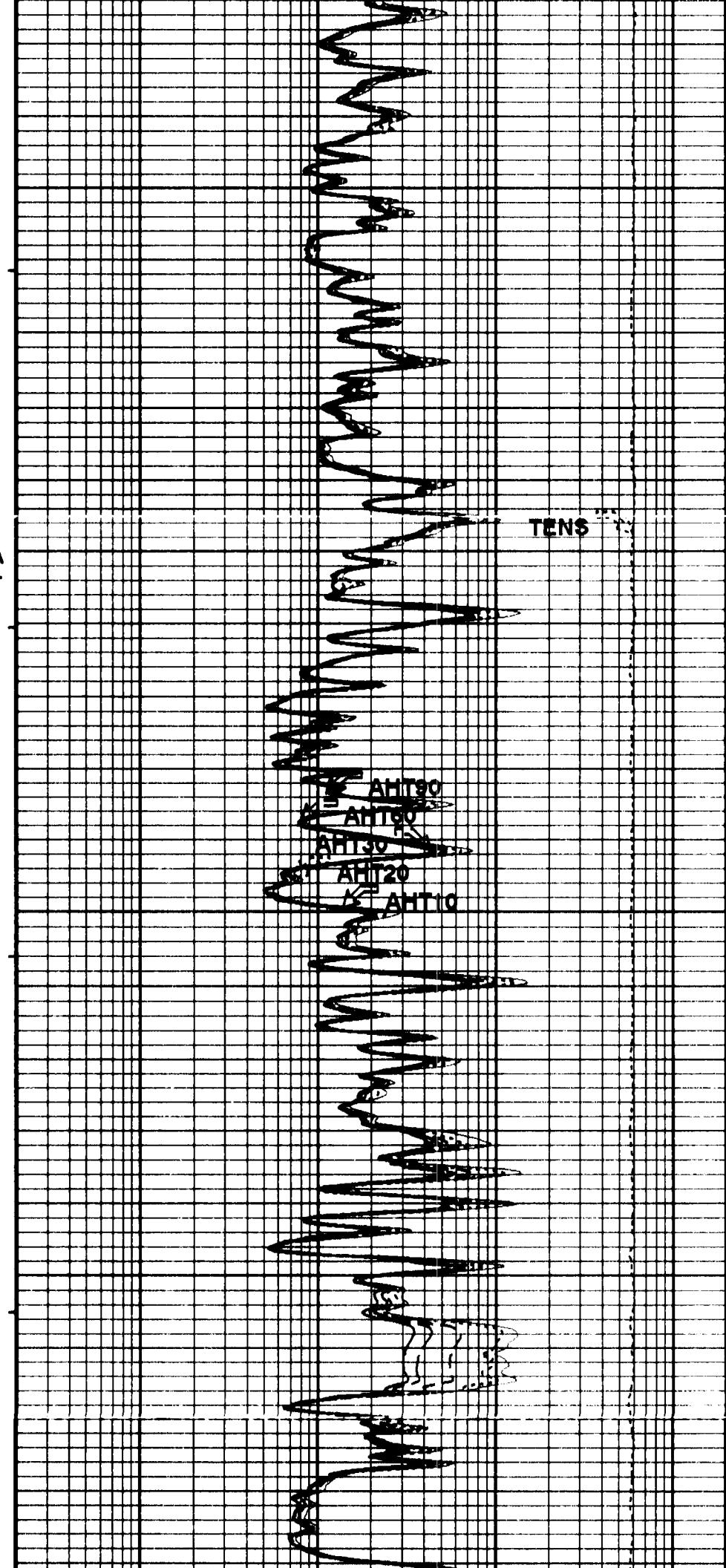
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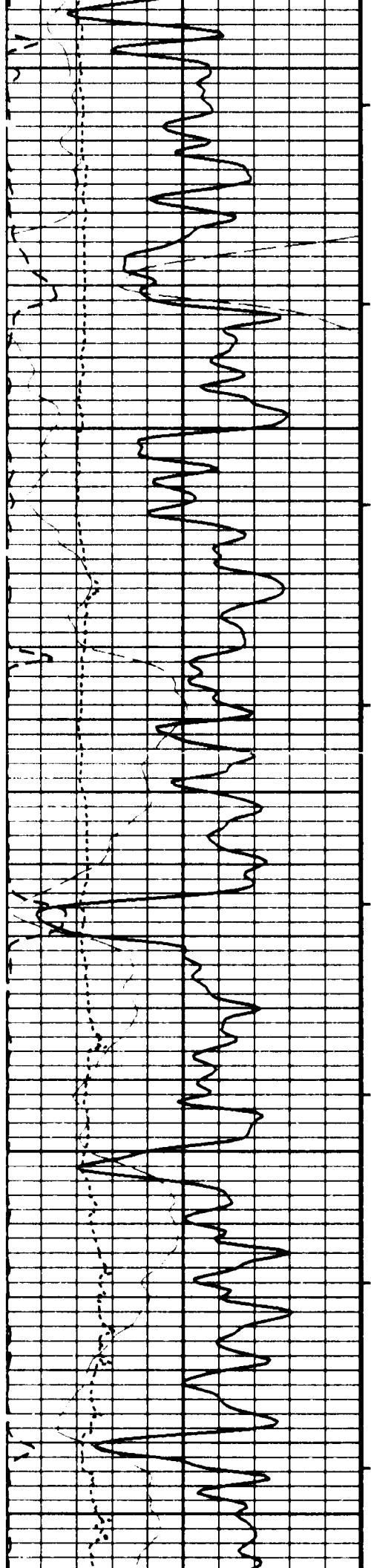
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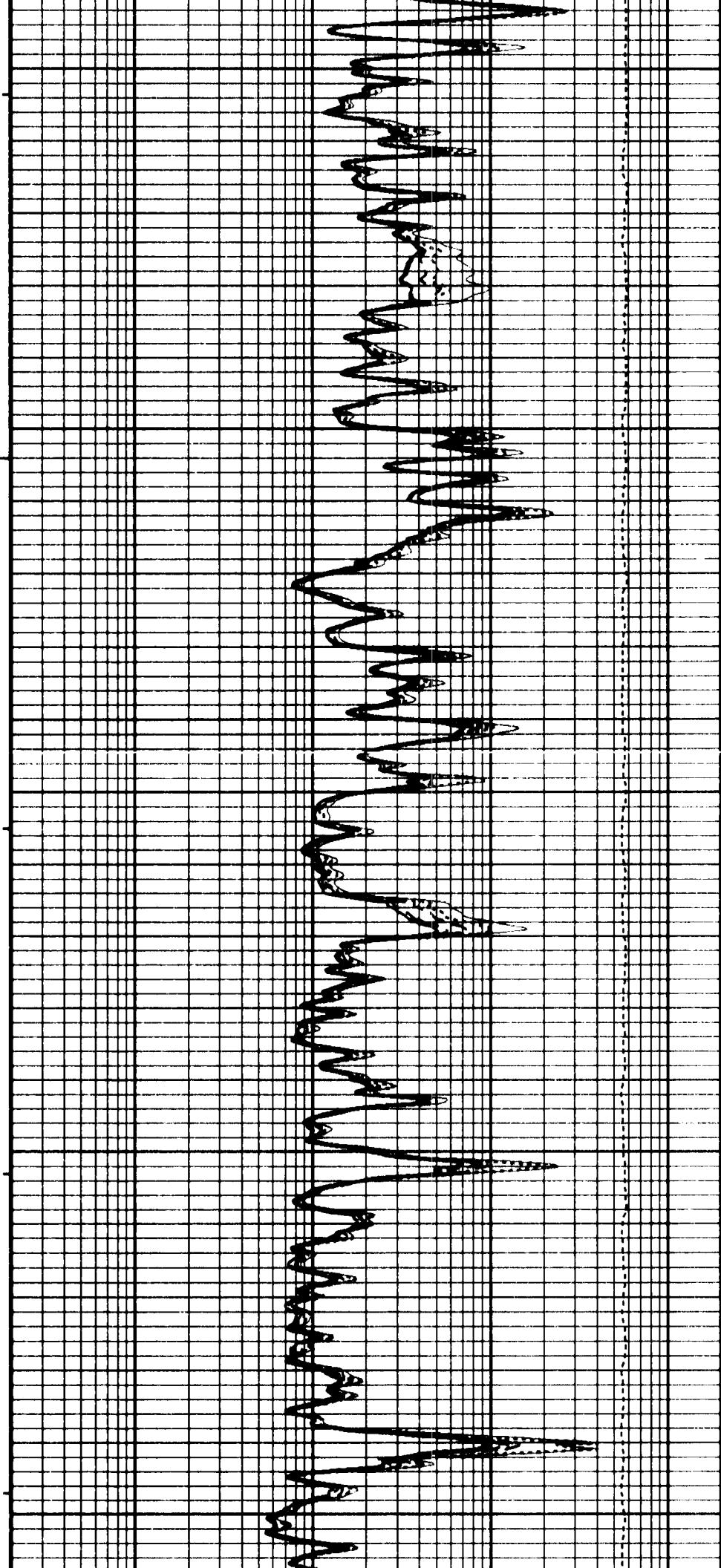
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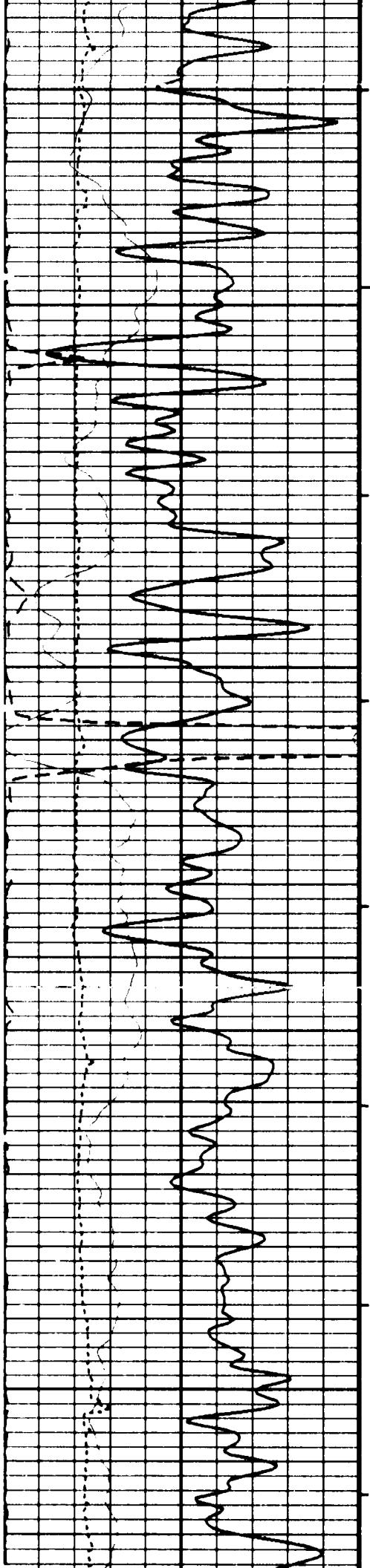




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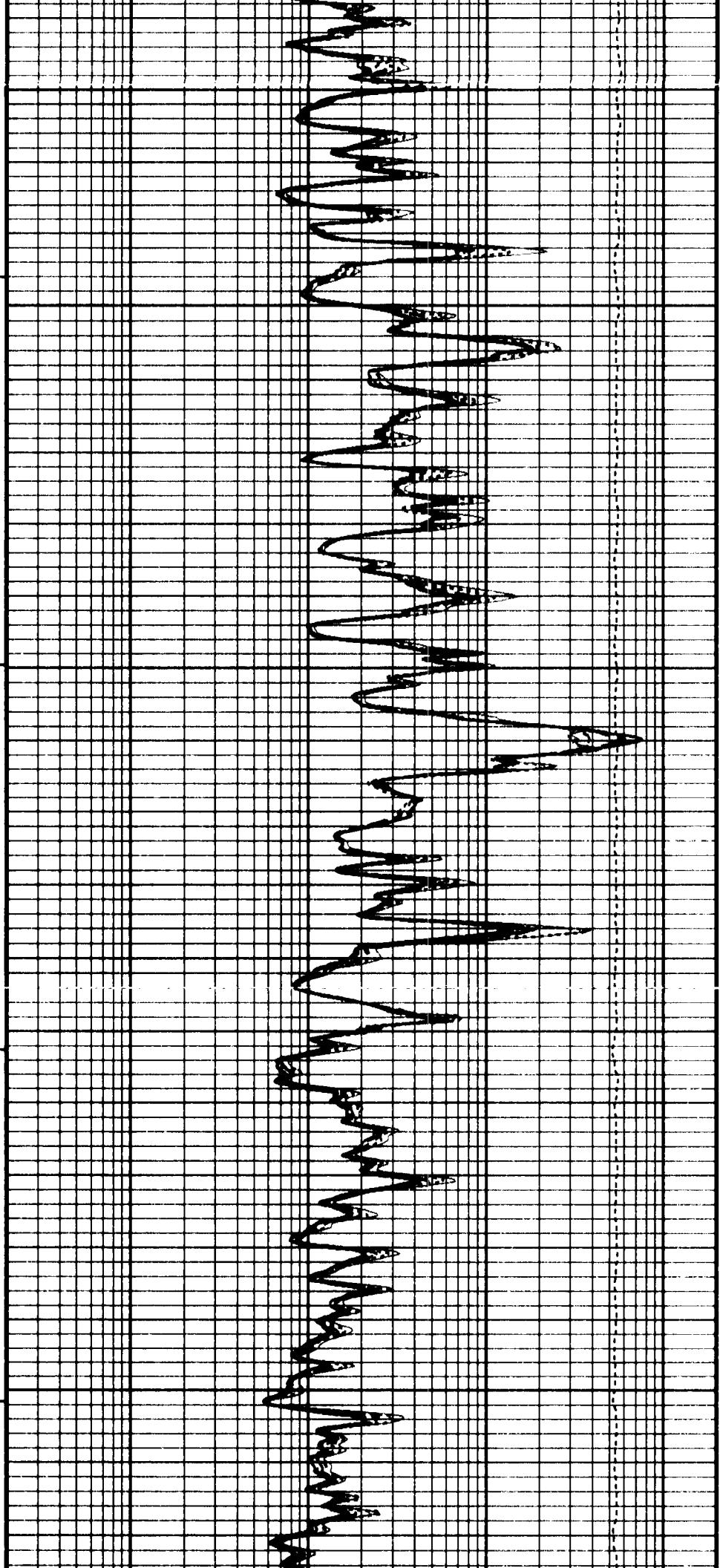
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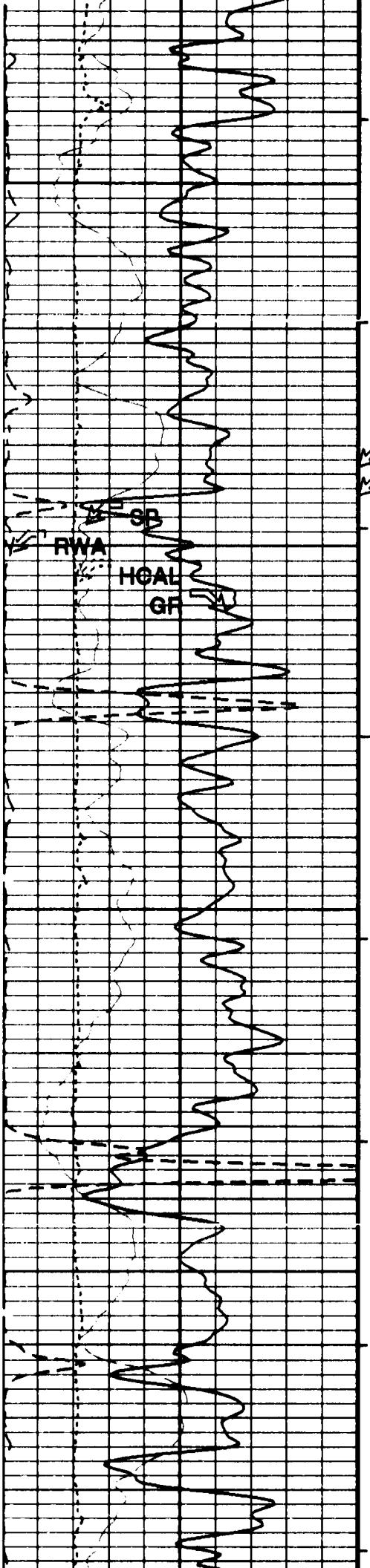




4600

4700



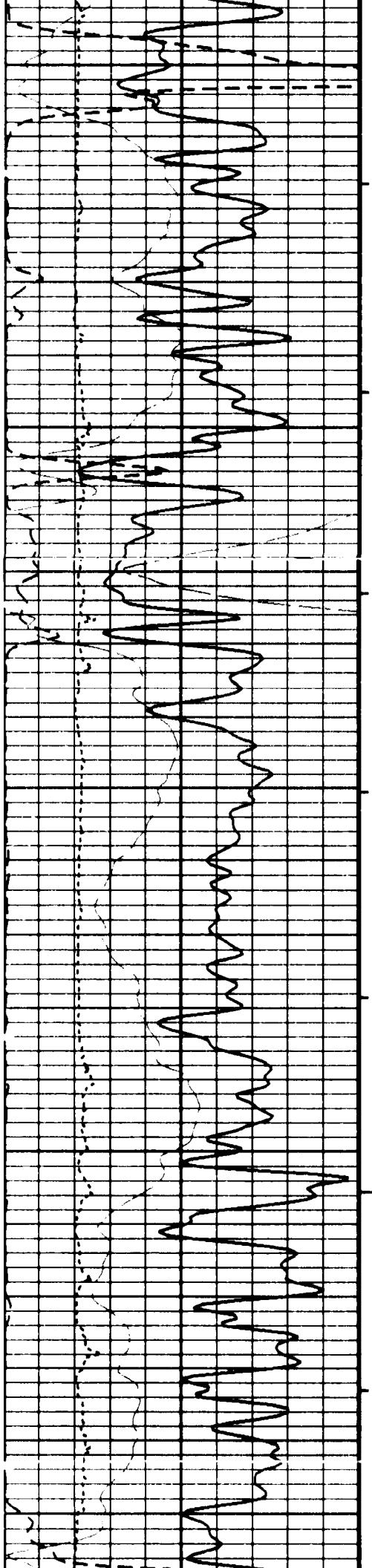


4800

4900

TENS

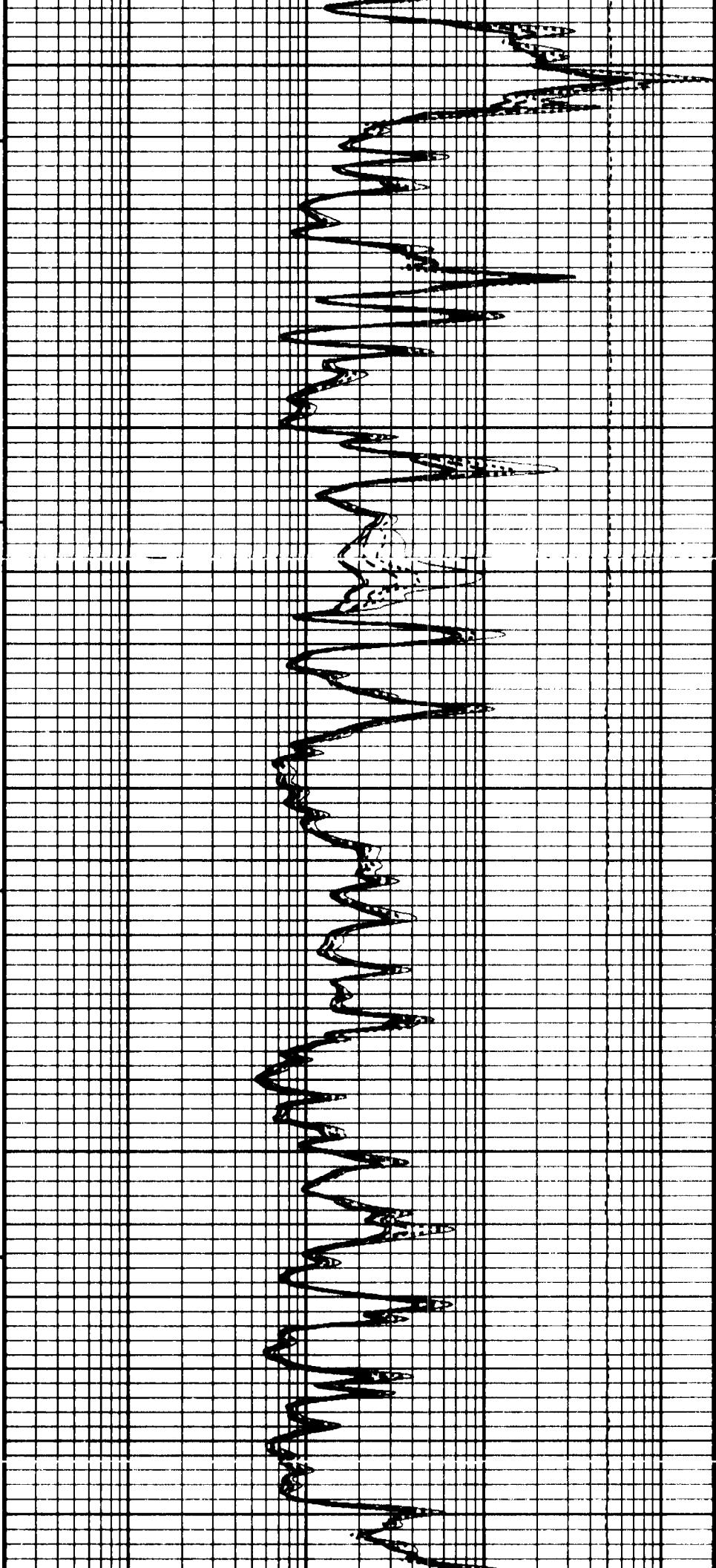
AHT50
AHT30
AHT20
AHT10

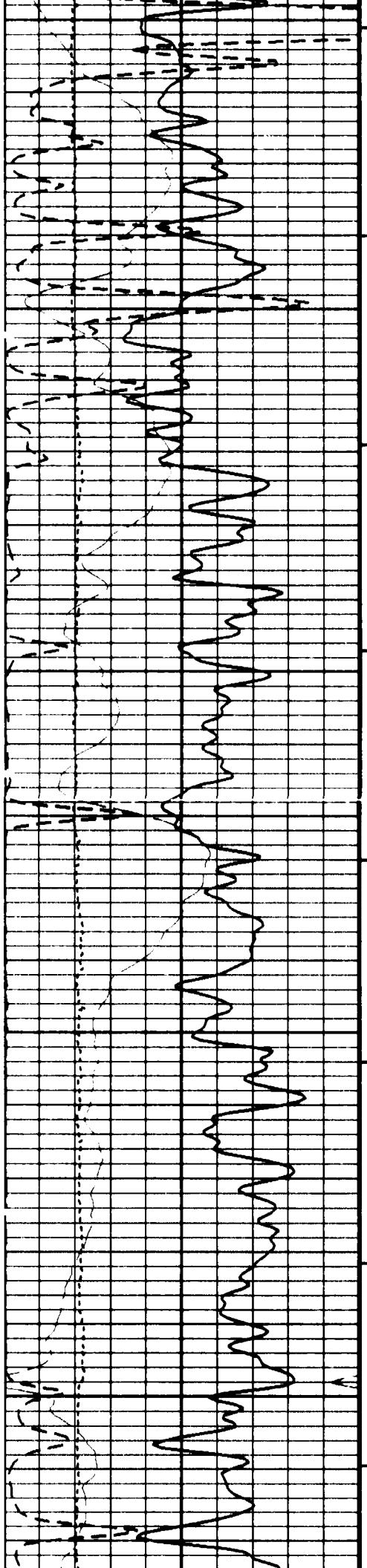


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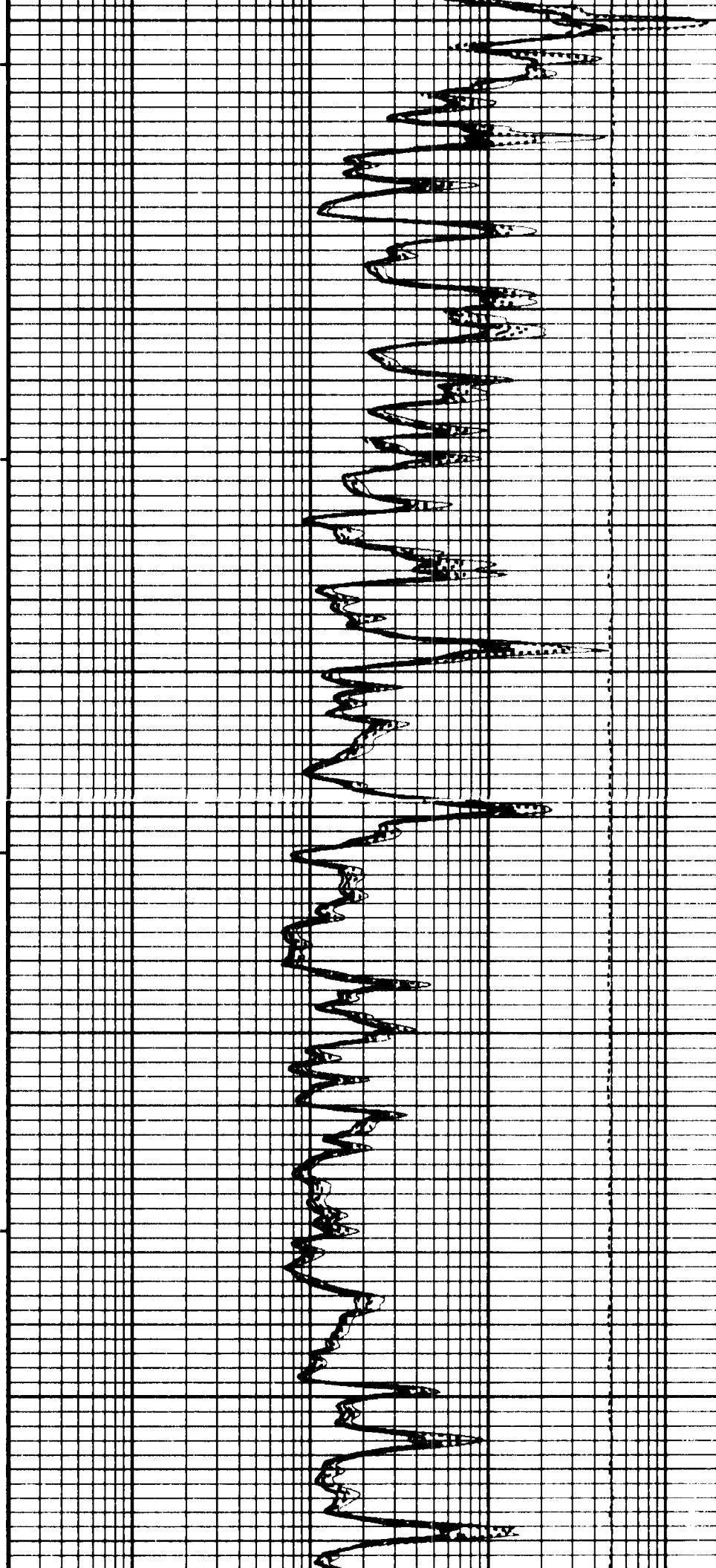
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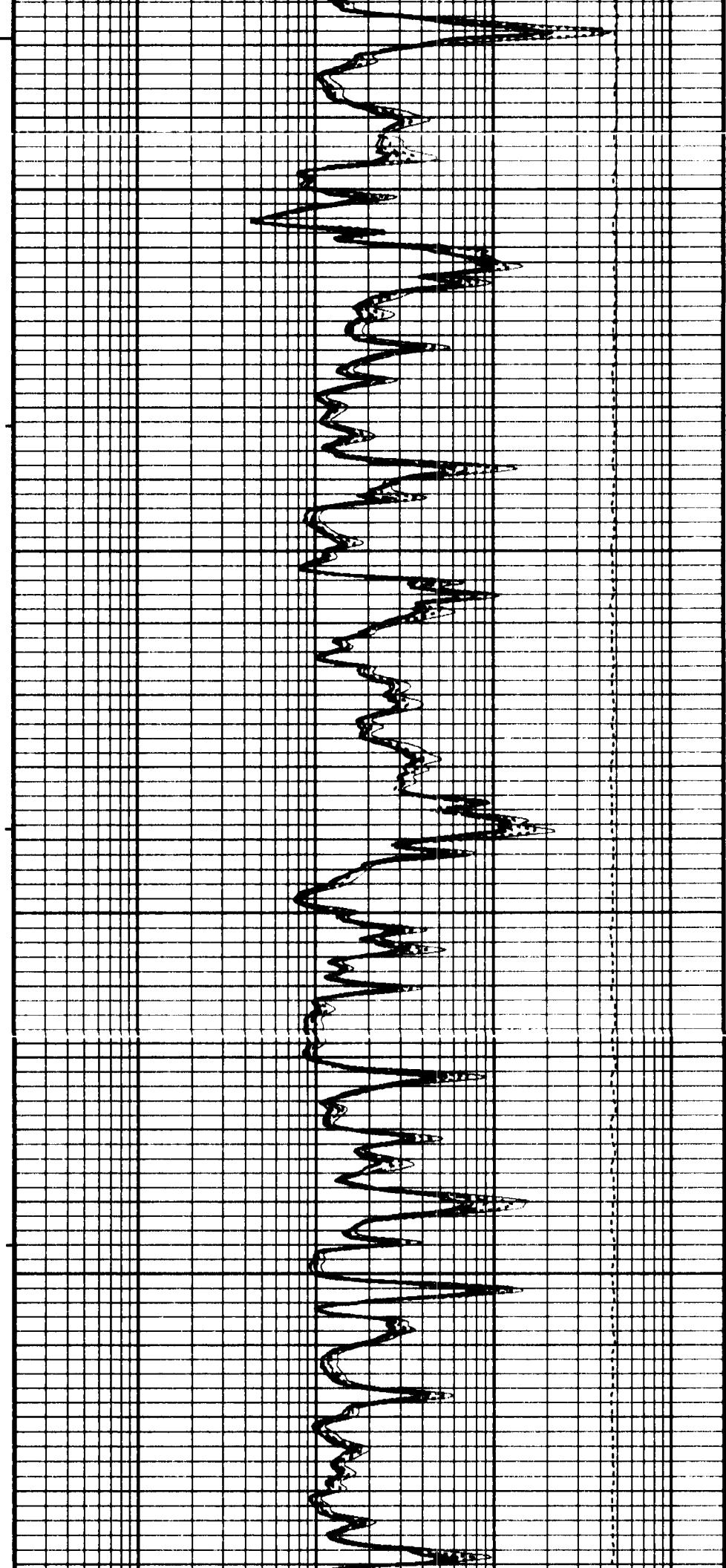
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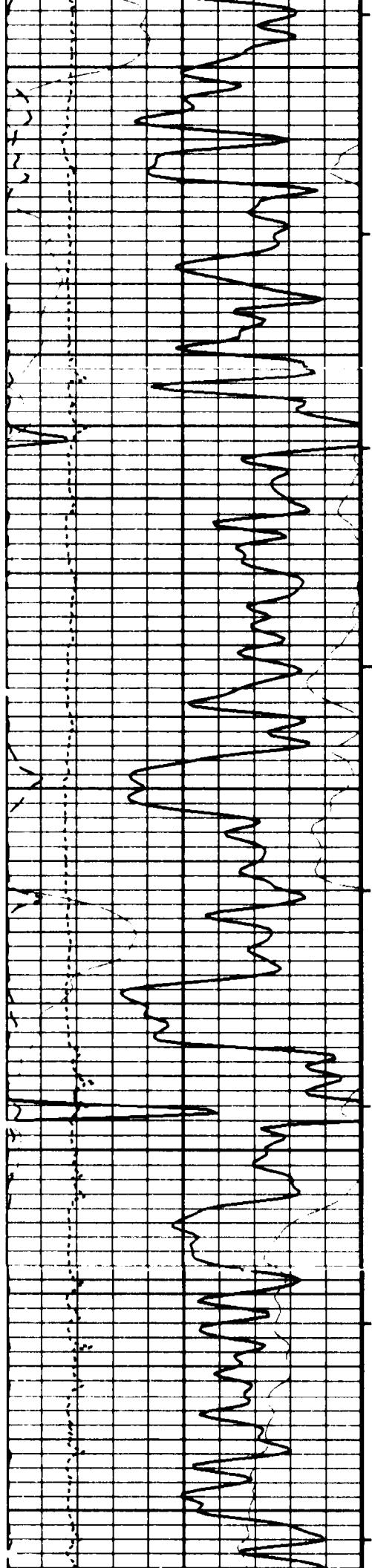




5500

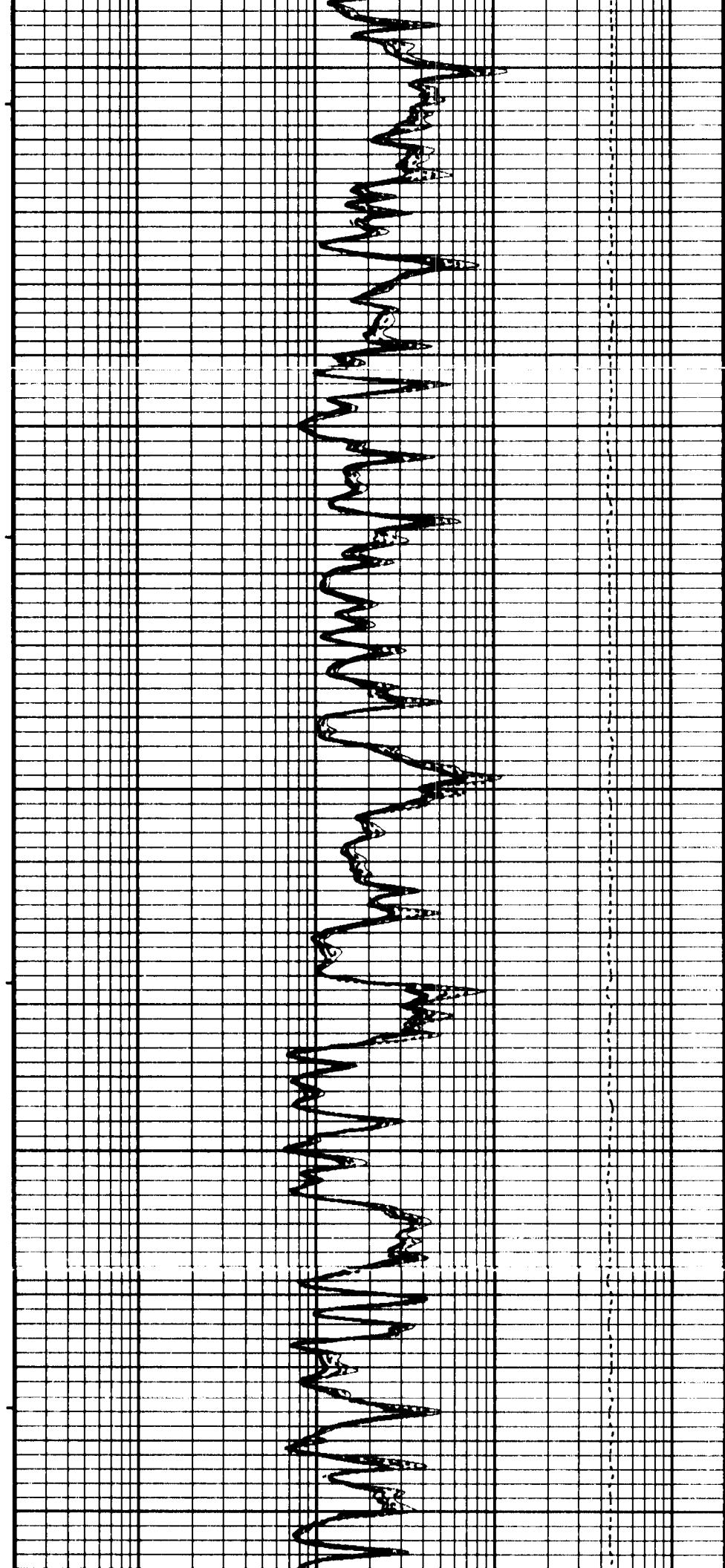
5600

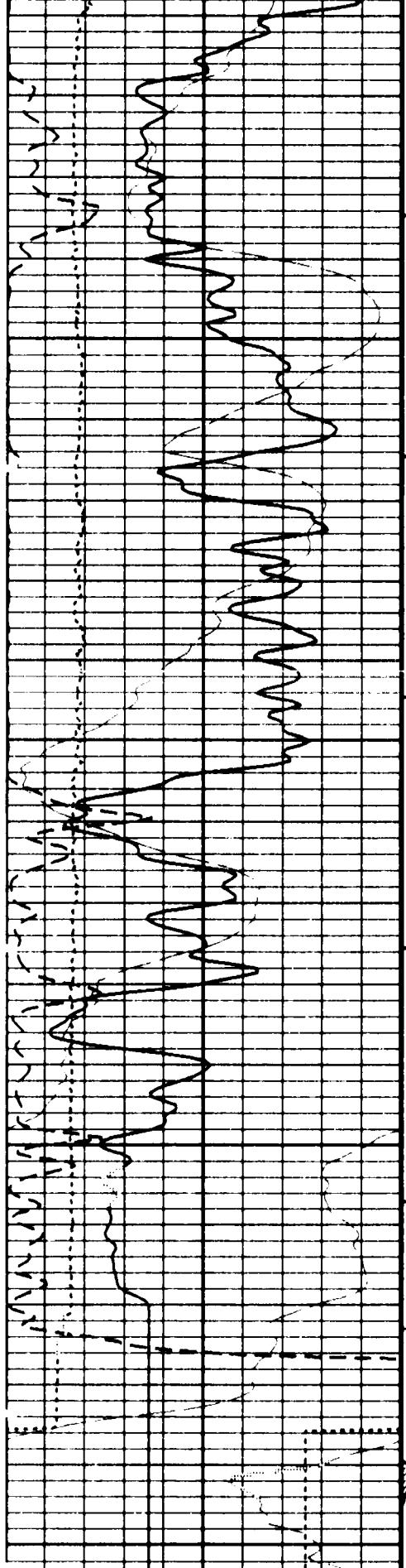




5700

5800





SP (SP)
(MV) 20
-80

Stuck
Stretch
(STIT)
0 50
0 (F)

Gamma Ray (GR)

Cable
Drag

AIT-H 10 Inch Investigation (AHT10) 2000

(OHMM)

AIT-H 20 Inch Investigation (AHT20)

0	GAMMA RAY (GR)	200	Drag From STIA to STIT	0.2	AIT-H 20 Inch Investigation (AHT20) (OHMM)	2000
6	Caliper (HCAL) (IN)	16	Tool/Tot. Drag From D3T to STIA	0.2	AIT-H 30 Inch Investigation (AHT30) (OHMM)	2000
0	RWA (RWA) (OHMM)	3		0.2	AIT-H 60 Inch Investigation (AHT60) (OHMM)	2000
				0.2	AIT-H 90 Inch Investigation (AHT90) (OHMM)	2000
	MAIN PASS				Tension (TENS) 10000 (LBF)	0

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

AIT-H Answer Product Processing Summary. Data taken with tool # 144 (AHTNO)

...Acquired data from HILT/HAIT

***** Bhole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECENTERED mode with a tool stand-off of 1.50 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT Answer Product processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other parameters used by AIT-H Answer Product processing *****

Surface Hole Temperature (SHT) 68.000 DEGF Bottom Temperature (BHT) 140.000 DEGF

Total Depth (TD) 6063.000 FT

***** AIT-H Answer Product processing control parameters *****

(AHAPL): 2_BholeCorr_BasicLogs

(AHBHM): 2_ComputeStandoff (AHBLM): 1_Two

Parameters

DLIS Name	Description	Value
AHBHM	AIT-H Bhole Correction Mode	_ComputeStandoff
AHBLM	AIT-H Basic Logs Mode	1_Two
AHCDE	AIT-H Casing Detection Enable	Yes
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000 FT
AHMRF	AIT-H Mud Resistivity Factor	1
AHSTA	AIT-H Tool Standoff	1.5 IN
ARTS	AIT Rt Selection (for ALLRES computation)	13_AHT90
BHT	Bottom Hole Temperature (used in calculations)	140 DEGF
BS	Bit Size	7.875 IN
DFD	Drilling Fluid Density	8.30 LB/G
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
FPHI	Form Factor Porosity Source	DPHZ
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0 DEG
GGRD	Geothermal Gradient	1.00000e-02 DF/F
GRSE	Generalized Mud Resistivity Selection	AITH_RESIST
GTSE	Generalized Temperature Selection	LINEAR_ESTIMATE
HSCM	HILT Speed Correction Mode	NO_SC
HSTI	STI Uses HILT Acceleration	NO
MST	Mud Sample Temperature	52.00 DEGF
RMFS	Resistivity of Mud Filtrate Sample	4.2900 OHMM
RTCO	RTCO - Rt Invasion Correction	YES
RW	Resistivity of Connate Water	0.2100 OHMM
SHT	Surface Hole Temperature	68 DEGF
SDMV	SD Next Value	0 MV

SPNV SP Next Value
 STKT STI Stuck Threshold
 TD Total Depth
 TWS Temperature of Connate Water Sample

0 MV
 4 FT
 6063 FT
 100.00 DEGF

Format: AITH_BasicLogTwo

Vertical Scale: 5' per 100'

Graphics File Created: 4-MAR-1998 15:11

OP System Version: 7C0-712

DBM

HILTB-CTS RPCV-999
HOLEV RPCV-999

RWA RPCV-999

Output DLIS Files

DEFAULT	HILTC .008	FN:9	FIELD	4-MAR-1998 15:11
POCI	HILTC .008	FN:10	CUST	4-MAR-1998 15:11

Input DLIS Files

DEFAULT	HILTC .006	FN:5	FIELD	4-MAR-1998 14:13	6060.0 FT	5667.5 FT
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Output DLIS Files

DEFAULT	HILTC .007	FN:7	FIELD	4-MAR-1998 14:36
POCI	HILTC .007	FN:8	CUST	4-MAR-1998 14:36

Integrated Hole/Cement Volume Summary

Hole Volume = 122.57 F3

Cement Volume = 58.81 F3 (assuming 5.50 IN casing O.D.)

Computed from 6060.0 FT to 5727.0 FT using data channel(s) HCAL

OP System Version: 7C0-712

DBM

HILTB-CTS RPCV-999
HOLEV RPCV-999

RWA RPCV-999

PIP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - ─ Integrated Cement Volume Minor Pip Every 10 F3
 - ─ Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

TENS REP Curve (TENS REP)
10000 (LBF) 0

REPEAT ANALYSIS

SP REP Curve (SP REP)
-80 (MV) 20

RWA REP Curve (RWA REP)
0 (OHMM) 3

HCAL REP Curve (HCAL REP)
6 (IN) 16

GR REP Curve (GR REP)
0 (GAPI) 200

AHT90 REP Curve (AHT90 REP)

0.2 (OHMM) 2000

AHT60 REP Curve (AHT60 REP)

0.2 (OHMM) 2000

AHT30 REP Curve (AHT30 REP)

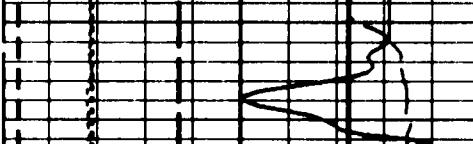
0.2 (OHMM) 2000

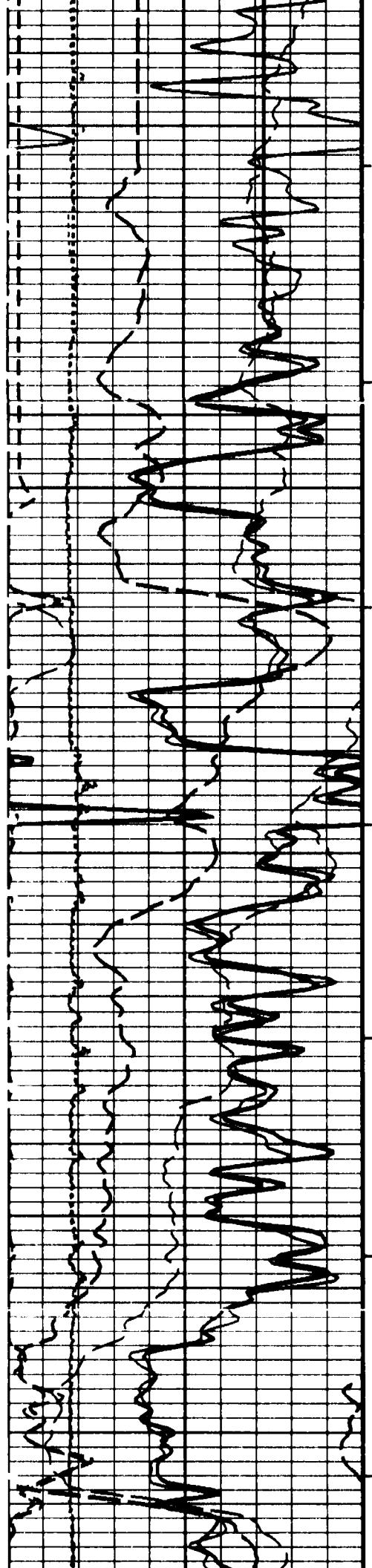
AHT20 REP Curve (AHT20 REP)

0.2 (OHMM) 2000

AHT10 REP Curve (AHT10 REP)

0.2 (OHMM) 2000

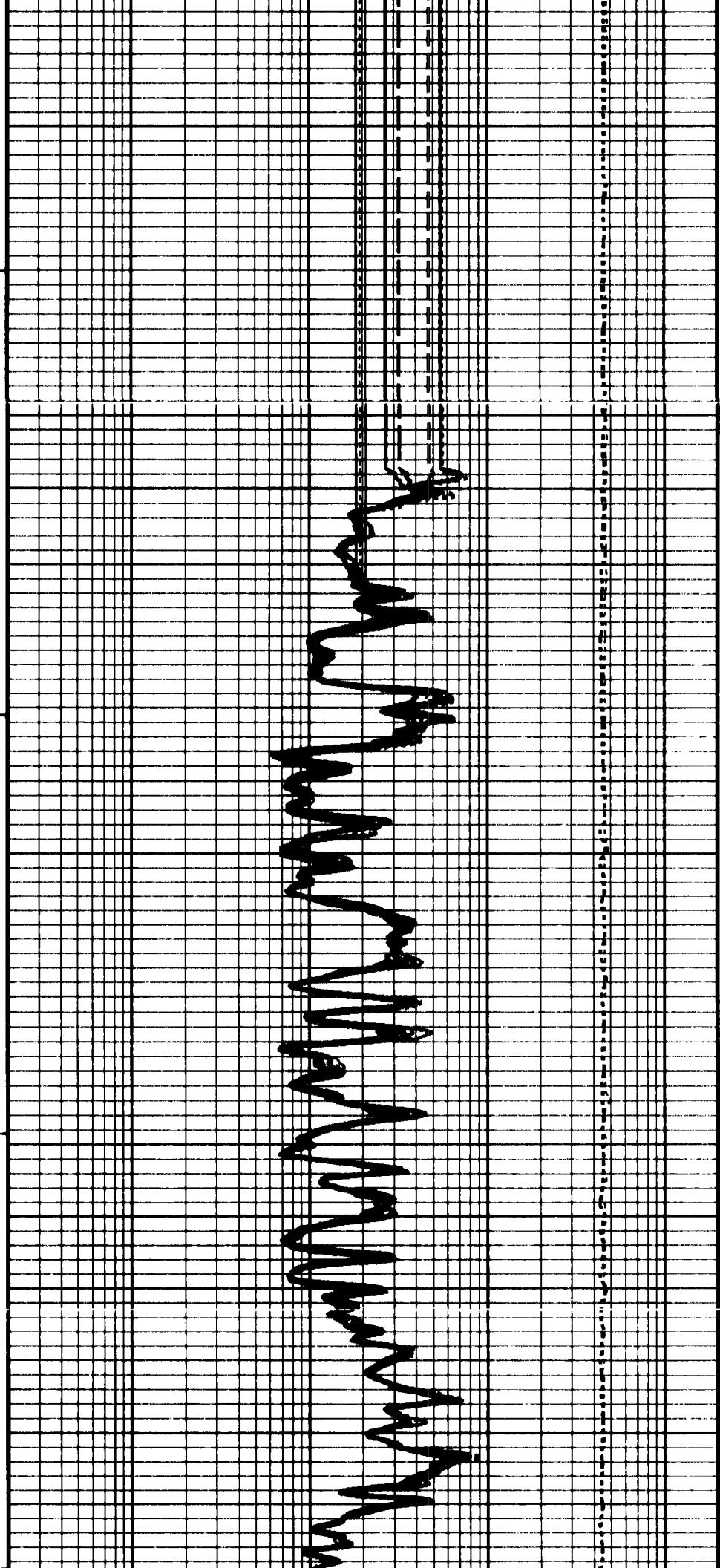


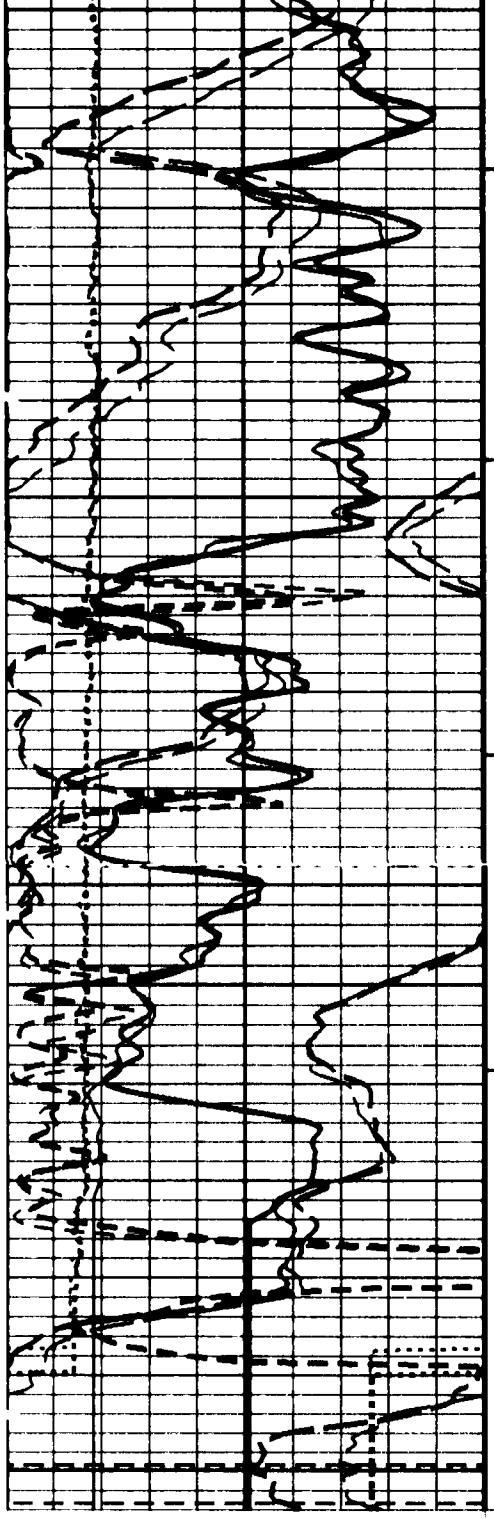


5700

5800

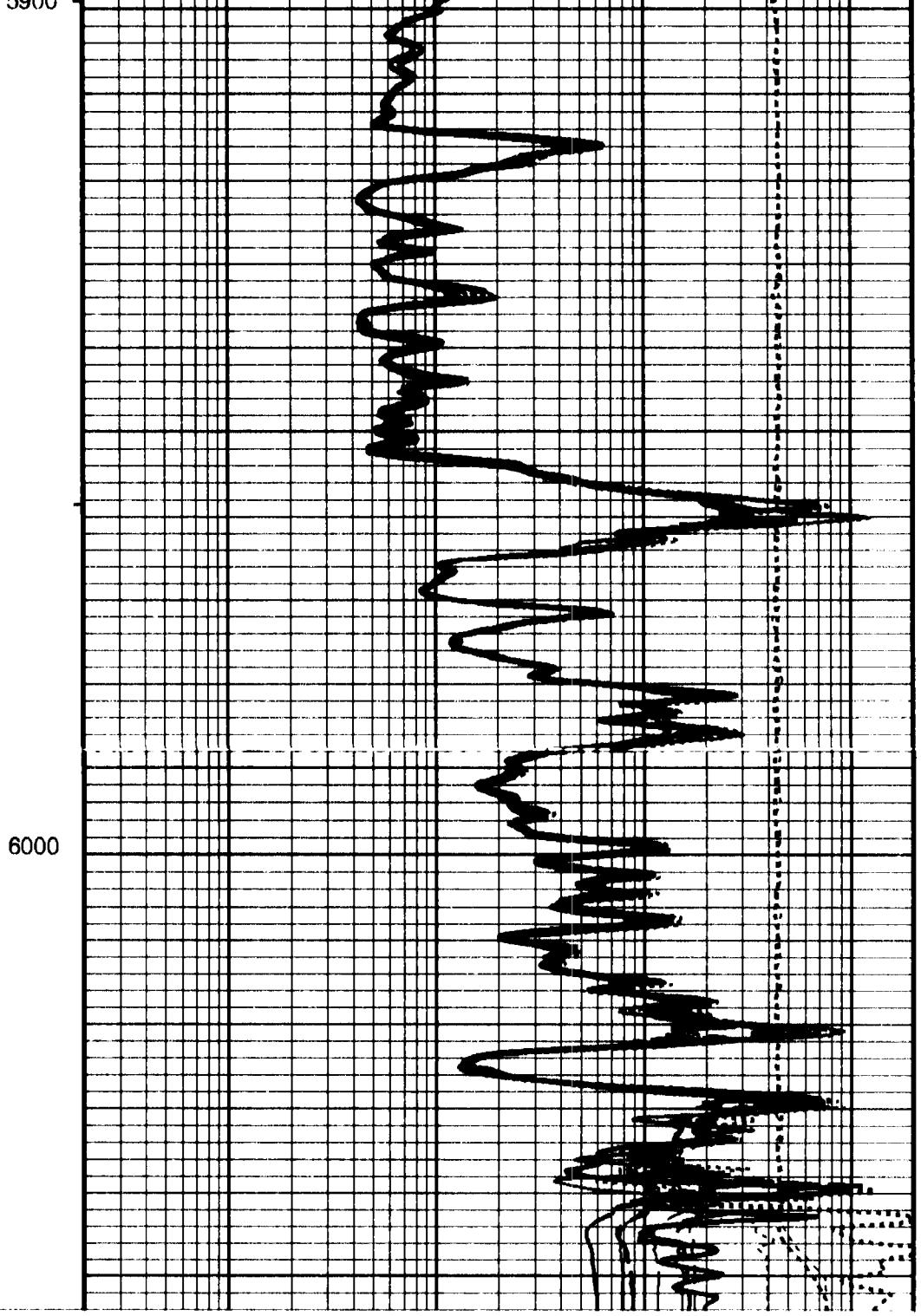
5900





0	(GAPI)	200
6	(IN)	16
0	(OHMM)	3
-80	(MV)	20

REPEAT ANALYSIS



0.2	(OHMM)	2000
10000	(LBF)	0

PiP SUMMARY

- └ Integrated Hole Volume Minor Pip Every 10 F3
- └ Integrated Hole Volume Major Pip Every 100 F3
 - Integrated Cement Volume Minor Pip Every 10 F3
 - Integrated Cement Volume Major Pip Every 100 F3

Time Mark Every 60 S

AIT-H Answer Product Processing Summary. Data taken with tool # 144 (AHTNO)

...Acquired data from HILT/HAIT

***** Bhole Correction *****

Effective Tool Standoff computed. Borehole diameter and mud res. taken as input (see GCSE and GRSE parameters)

Tool is run in ECENTERED mode with a tool stand-off of 1.50 IN. Bit Size is 7.88 IN.

***** Input Selections to AIT Answer Product processing *****

Caliper (GCSE): HCAL Mud Resistivity (GRSE): AHMF Temperature (GTSE): LINEAR_ESTIMATE Porosity (FPHI): DPHZ

***** Other parameters used by AIT-H Answer Product processing *****

Surface Hole Temperature (SHT)	68.000 DEGF	Bottom Temperature (BHT)	140.000 DEGF
Total Depth (TD)	6063.000 FT		
Form Factor Exponent (FEXP)	2.000	Form Factor Numerator (FNUM)	1.000
Mud Filtrate Sample Resistivity (RMFS)	4.290 OHMM	Mud Filtrate Sample Temperature (MFST)	52.000 DEGF
Resistivity Connate Water (RW)	0.210 OHMM		

***** AIT-H Answer Product processing control parameters *****

Playback Mode: NORMAL

Parameters

DLIS Name	Description	Value
AHBHM	AIT-H Bhole Correction Mode	2_ComputeStandoff
AHBLM	AIT-H Basic Log Mode	1_Two
AHCDE	AIT-H Casing Detection Enable	Yes
AHCEN	AIT-H Tool Centering Flag (in Borehole)	Eccentered
AHCSED	AIT-H Casing Shoe Estimated Depth	-50000
AHMRF	AIT-H Mud Resistivity Factor	1
AHSTA	AIT-H Tool Standoff	1.5
ARTS	AIT Rt Selection (for ALLRES computation)	13_AHT90
BHT	Bottom Hole Temperature (used in calculations)	140
BS	Bit Size	7.875
DFD	Drilling Fluid Density	8.30
DORL	Depth Offset Repeat Analysis	0.0
FEXP	Form Factor Exponent	2
FNUM	Form Factor Numerator	1
FPHI	Form Factor Porosity Source	DPHZ
GCSE	Generalized Caliper Selection	HCAL
GDEV	Average Angular Deviation of Borehole from Normal	0
GGRD	Geothermal Gradient	1.000000e-02
GRSE	Generalized Mud Resistivity Selection	AITH RESIST
GTSE	Generalized Temperature Selection	LINEAR ESTIMATE
HSCM	HILT Speed Correction Mode	TSCD_SPEED_CORRECTION
HSTI	STI Uses HILT Acceleration	YES
MST	Mud Sample Temperature	52.00
RMFS	Resistivity of Mud Filtrate Sample	4.2900
RTCO	RTCO - Rt Invasion Correction	YES
RW	Resistivity of Connate Water	0.2100
SHT	Surface Hole Temperature	68
SPNV	SP Next Value	0
TD	Total Depth	6063
TWS	Temperature of Connate Water Sample	100.00

Format: AITH_BasicLogTwo_REP Vertical Scale: 5" per 100'

Graphics File Created: 4-MAR-1998 14:36

OP System Version: 7C0-712
DBM

HILTB-CTS
HOLEV

RPCV-999
RPCV-999

RWA

RPCV-999

Speed Corrected - Depth Matched LOG

Input DLIS Files

DEFAULT

HILTC-001

EN-5

FIELD

4-MAR-1998 14:12

6063.0 FT

5007.5 FT

DEFAULT

HILTC .006

FN:5

FIELD

4-MAR-1998 14:13

6060.0 FT

5667.5 FT

Output DLIS Files

DEFAULT

HILTC .007

FN:7

FIELD

4-MAR-1998 14:36

POCI

HILTC .007

FN:8

CUST

4-MAR-1998 14:36

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
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High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Thru Cal Mag. & Phase

Master: Mar 3 15:38 1998 Before: Mar 4 08:26 1998

Thru Cal Magnitude - 0	0	0.6062	0.6063	N/A	N/A	N/A	V
Thru Cal Magnitude - 1	0	1.243	1.243	N/A	N/A	N/A	V
Thru Cal Magnitude - 2	0	0.6177	0.6178	N/A	N/A	N/A	V
Thru Cal Magnitude - 3	0	0.6984	0.6986	N/A	N/A	N/A	V
Thru Cal Magnitude - 4	0	1.309	1.309	N/A	N/A	N/A	V
Thru Cal Magnitude - 5	0	1.896	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude - 6	0	1.895	1.896	N/A	N/A	N/A	V
Thru Cal Magnitude - 7	0	1.360	1.361	N/A	N/A	N/A	V
Phase - 0	0	51.07	51.11	N/A	N/A	N/A	DEG
Phase - 1	0	49.98	50.02	N/A	N/A	N/A	DEG
Phase - 2	0	46.22	46.28	N/A	N/A	N/A	DEG
Phase - 3	0	45.44	45.49	N/A	N/A	N/A	DEG
Phase - 4	0	39.08	39.14	N/A	N/A	N/A	DEG
Phase - 5	0	37.22	37.28	N/A	N/A	N/A	DEG
Phase - 6	0	37.21	37.27	N/A	N/A	N/A	DEG
Phase - 7	0	33.39	33.51	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Electronics Calibration Check - Auxillary

Master: Mar 3 15:38 1998 Before: Mar 4 08:26 1998

AIT-H SPA Plus	990.5	992.8	992.9	N/A	N/A	N/A	MV
AIT-H SPA Zero	0	0.3988	0.3983	N/A	N/A	N/A	MV
AIT-H Temperature Plus	0.9150	0.9197	0.9198	N/A	N/A	N/A	V
AIT-H Temperature Zero	0	0.0004027	0.0004047	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Test Loop Gain Correction

Master: Mar 3 15:38 1998

Test Loop Gain Magnitude - 0	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 1	0	1.012	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 2	0	1.019	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 3	0	1.015	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 4	0	0.9914	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 5	0	0.9925	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 6	0	1.004	N/A	N/A	N/A	N/A	V
Test Loop Gain Magnitude - 7	0	1.016	N/A	N/A	N/A	N/A	V
Phase - 0	0	0.3987	N/A	N/A	N/A	N/A	DEG
Phase - 1	0	0.5347	N/A	N/A	N/A	N/A	DEG
Phase - 2	0	-0.2321	N/A	N/A	N/A	N/A	DEG
Phase - 3	0	0.1539	N/A	N/A	N/A	N/A	DEG
Phase - 4	0	0.3821	N/A	N/A	N/A	N/A	DEG
Phase - 5	0	-0.2901	N/A	N/A	N/A	N/A	DEG
Phase - 6	0	0.1364	N/A	N/A	N/A	N/A	DEG
Phase - 7	0	-0.2994	N/A	N/A	N/A	N/A	DEG

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Sonde Error Correction

Master: Mar 3 15:38 1998

R Sonde Error Correction - 0	0	-93.86	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 1	0	161.8	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 2	0	107.6	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 3	0	64.57	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 4	0	25.88	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 5	0	14.54	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 6	0	9.814	N/A	N/A	N/A	N/A	MM/M
R Sonde Error Correction - 7	0	-0.6669	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 0	0	5.647	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 1	0	-43.27	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 2	0	-133.4	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 3	0	83.37	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 4	0	-8.148	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 5	0	-9.012	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 6	0	5.059	N/A	N/A	N/A	N/A	MM/M
X Sonde Error Correction - 7	0	9.732	N/A	N/A	N/A	N/A	MM/M

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Mud Gain Correction

Master: Mar 3 15:38 1998

Coarse - Mag, Real, Imag - 0	0	1.099	N/A	N/A	N/A	N/A
Coarse - Mag, Real, Imag - 1	0	1.099	N/A	N/A	N/A	N/A
Coarse - Mag, Real, Imag - 2	0	1.099	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 0	0	1.097	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 1	0	1.097	N/A	N/A	N/A	N/A
Fine - Mag, Real, Imag - 2	0	1.097	N/A	N/A	N/A	N/A

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Stab Measurement Summary

Before: Mar 4 08:29 1998

BS Window Ratio	1.004	N/A	1.005	N/A	N/A	N/A	CPS
BS Window Sum	15360	N/A	15350	N/A	N/A	N/A	
SS Window Ratio	0.4887	N/A	0.4873	N/A	N/A	N/A	
SS Window Sum	12830	N/A	12810	N/A	N/A	N/A	CPS
LS Window Ratio	0.3026	N/A	0.3009	N/A	N/A	N/A	
LS Window Sum	1516	N/A	1508	N/A	N/A	N/A	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Photo-multiplier High Voltages Calibrations

Before: Mar 4 08:29 1998

BS PM High Voltage (Command)	1496	N/A	1514	N/A	N/A	N/A	V
SS PM High Voltage (Command)	1898	N/A	1883	N/A	N/A	N/A	V
LS PM High Voltage (Command)	1811	N/A	1801	N/A	N/A	N/A	V

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Crystal Quality Resolutions Calibration

Before: Mar 4 08:29 1998

BS Crystal Resolution	12.13	N/A	12.40	N/A	N/A	N/A	%
SS Crystal Resolution	10.18	N/A	10.15	N/A	N/A	N/A	%
LS Crystal Resolution	8.332	N/A	9.389	N/A	N/A	N/A	%

High resolution Integrated Logging Tool-CTS Wellsite Calibration - MCFL Calibration

Before: Mar 4 08:34 1998

Raw B0 Resistivity	3875	N/A	3835	N/A	N/A	N/A	OHMM
Raw B1 Resistivity	3830	N/A	3822	N/A	N/A	N/A	OHMM
Raw B2 Resistivity	3830	N/A	3814	N/A	N/A	N/A	OHMM

High resolution Integrated Logging Tool-CTS Wellsite Calibration - HILT Caliper Calibration

Before: Mar 4 08:26 1998

HILT Caliper Zero Measurement	8.000	N/A	7.919	N/A	N/A	N/A	IN
HILT Caliper Plus Measurement	12.00	N/A	12.06	N/A	N/A	N/A	IN

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Detector Calibration

Before: Mar 4 08:26 1998

Gamma Ray Background	30.00	N/A	60.58	N/A	N/A	N/A	GAPI
Gamma Ray (Jig - Bkg)	174.1	N/A	174.1	N/A	N/A	15.83	GAPI
Gamma Ray (Calibrated)	165.0	N/A	165.0	N/A	N/A	15.00	GAPI

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Zero Measurement

Master: Jan 10 12:42 1998 Before: Mar 4 08:27 1998

CNTC Background	29.24	29.24	29.77	N/A	N/A	4.386	CPS
CFTC Background	25.04	25.04	25.81	N/A	N/A	3.756	CPS

High resolution Integrated Logging Tool-CTS Wellsite Calibration - Accelerometer Calibration

Before: Mar 4 14:11 1998

Z-Axis Acceleration	32.18	N/A	32.14	N/A	N/A	N/A	F/S2
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The GLS-VJ source activity is acceptable.

The HGNS Neutron Master Calibration was done with the following parameters :

NCT-B Water Temperature 64.0 DEGF.

Thermal Housing Size 3.375 IN.

High resolution Integrated Logging Tool-CTS / Equipment Identification

Primary Equipment:

Array Induction Tool - H	AIT - H
Array Induction Sonde	AHIS - BA
HILT high-Resolution Mechanical Sonde	HRMS - B
HILT Rxo Gamma-ray Device	HRGD -
HILT Nuclear Back-Scatter Detector	HILT -
HILT Nuclear Short-Spacing Detector	HILT -
HILT Nuclear Long-Spacing Detector	HILT -
Micro Cylindrically Focused Log Device	MCFL -

Auxiliary Equipment:

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Electronics Calibration Check - Thru Cal Mag. & Phase									
Idx	Phase	Value	Thru Cal Magnitude V		Nominal	Value	Phase DEG		Nominal
0	Master	0.6062	<input type="checkbox"/>	<input type="checkbox"/>	0.6050	51.07	<input type="checkbox"/>	<input type="checkbox"/>	71.00
	Before	0.6063	<input type="checkbox"/>	<input type="checkbox"/>		51.11	<input type="checkbox"/>	<input type="checkbox"/>	
1	Master	1.243	<input type="checkbox"/>	<input type="checkbox"/>	1.270	49.98	<input type="checkbox"/>	<input type="checkbox"/>	70.00
	Before	1.243	<input type="checkbox"/>	<input type="checkbox"/>		50.02	<input type="checkbox"/>	<input type="checkbox"/>	
2	Master	0.6177	<input type="checkbox"/>	<input type="checkbox"/>	0.6230	46.22	<input type="checkbox"/>	<input type="checkbox"/>	66.00
	Before	0.6178	<input type="checkbox"/>	<input type="checkbox"/>		46.26	<input type="checkbox"/>	<input type="checkbox"/>	
3	Master	0.6964	<input type="checkbox"/>	<input type="checkbox"/>	0.7040	45.44	<input type="checkbox"/>	<input type="checkbox"/>	65.00
	Before	0.6965	<input type="checkbox"/>	<input type="checkbox"/>		45.49	<input type="checkbox"/>	<input type="checkbox"/>	
4	Master	1.309	<input type="checkbox"/>	<input type="checkbox"/>	1.337	39.08	<input type="checkbox"/>	<input type="checkbox"/>	59.00
	Before	1.309	<input type="checkbox"/>	<input type="checkbox"/>		39.14	<input type="checkbox"/>	<input type="checkbox"/>	
5	Master	1.896	<input type="checkbox"/>	<input type="checkbox"/>	1.955	37.22	<input type="checkbox"/>	<input type="checkbox"/>	57.00
	Before	1.896	<input type="checkbox"/>	<input type="checkbox"/>		37.28	<input type="checkbox"/>	<input type="checkbox"/>	
6	Master	1.895	<input type="checkbox"/>	<input type="checkbox"/>	1.955	37.21	<input type="checkbox"/>	<input type="checkbox"/>	57.00
	Before	1.896	<input type="checkbox"/>	<input type="checkbox"/>		37.27	<input type="checkbox"/>	<input type="checkbox"/>	
7	Master	1.360	<input type="checkbox"/>	<input type="checkbox"/>	1.415	33.39	<input type="checkbox"/>	<input type="checkbox"/>	53.00
	Before	1.361	<input type="checkbox"/>	<input type="checkbox"/>		33.51	<input type="checkbox"/>	<input type="checkbox"/>	
60.00 % (Minimum)			140.0 % (Maximum)			Nom -60.00 (Minimum)	Nom + 60.00 (Maximum)		

Master: Mar 3 15:38 1998

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Electronics Calibration Check - Auxiliary									
Phase	AIT-H SPA Plus MV			Value	Phase	AIT-H SPA Zero MV			Value
Master	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	992.8	Master	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.3998
Before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	992.9	Before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.3993
941.0 (Minimum)	990.5 (Nominal)	1040 (Maximum)			-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)		
Phase	AIT-H Temperature Plus V			Value	Phase	AIT-H Temperature Zero V			Value
Master	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.9197	Master	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.0004027
Before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.9198	Before	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.0004047
0.8700 (Minimum)	0.9150 (Nominal)	0.9600 (Maximum)			-0.05000 (Minimum)	0 (Nominal)	0.05000 (Maximum)		

Master: Mar 3 15:38 1998

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration									
Test Loop Gain Correction									
Idx	Value	Test Loop Gain Magnitude V			Value	Phase DEG			
0	1.015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.3987	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)		
1	1.012	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.5347	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)		
2	1.019	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-0.2321	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)		
3	1.015	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-0.1539	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)		-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)		
4	0.9914	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0.2521	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

4	0.9914		0.3621			
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
5	0.9925			-0.2901		
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
6	1.004			0.1364		
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)
7	1.016			-0.2894		
	0.9500 (Minimum)	1.000 (Nominal)	1.050 (Maximum)	-3.000 (Minimum)	0 (Nominal)	3.000 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Sonde Error Correction

Idx	Value	R Sonde Error Correction MM/M	Value	X Sonde Error Correction MM/M		
0	-93.66	<input type="text"/>	5.647	<input type="text"/>		
	-231.0 (Minimum)	-56.00 (Nominal)	119.0 (Maximum)	-2250 (Minimum)	0 (Nominal)	2250 (Maximum)
1	161.8	<input type="text"/>	-43.27	<input type="text"/>		
	114.0 (Minimum)	159.0 (Nominal)	204.0 (Maximum)	-625.0 (Minimum)	0 (Nominal)	625.0 (Maximum)
2	107.6	<input type="text"/>	-133.4	<input type="text"/>		
	66.00 (Minimum)	111.0 (Nominal)	156.0 (Maximum)	-350.0 (Minimum)	0 (Nominal)	350.0 (Maximum)
3	64.57	<input type="text"/>	83.37	<input type="text"/>		
	39.00 (Minimum)	64.00 (Nominal)	89.00 (Maximum)	-250.0 (Minimum)	0 (Nominal)	250.0 (Maximum)
4	25.88	<input type="text"/>	-8.148	<input type="text"/>		
	15.00 (Minimum)	25.00 (Nominal)	35.00 (Maximum)	-63.00 (Minimum)	0 (Nominal)	63.00 (Maximum)
5	14.54	<input type="text"/>	-9.012	<input type="text"/>		
	4.000 (Minimum)	14.00 (Nominal)	24.00 (Maximum)	-50.00 (Minimum)	0 (Nominal)	50.00 (Maximum)
6	9.814	<input type="text"/>	5.059	<input type="text"/>		
	5.000 (Minimum)	10.00 (Nominal)	15.00 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)
7	-0.6669	<input type="text"/>	9.732	<input type="text"/>		
	-5.000 (Minimum)	0 (Nominal)	5.000 (Maximum)	-30.00 (Minimum)	0 (Nominal)	30.00 (Maximum)

Master Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Mud Gain Correction

Mud Gain Correction						
Ictx	Value	Coarse - Mag, Real, Imag		Value	Fine - Mag, Real, Imag	
0	1.099		<input checked="" type="checkbox"/>	1.097		<input checked="" type="checkbox"/>
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
1	1.099		<input checked="" type="checkbox"/>	1.097		<input checked="" type="checkbox"/>
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)
2	1.099		<input checked="" type="checkbox"/>	1.097		<input checked="" type="checkbox"/>
	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)	0.6000 (Minimum)	1.000 (Nominal)	1.400 (Maximum)

Master: Mar 3 15:38 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration

Stab Measurement Summary

Phase	BS Window Ratio	Value	Phase	SS Window Ratio	Value	Phase	LS Window Ratio	Value
Before		1.005	Before		0.4873	Before		0.3009
0.9537 (Minimum)	1.004 (Nominal)	1.054 (Maximum)	0.4623 (Minimum)	0.4887 (Nominal)	0.5110 (Maximum)	0.2874 (Minimum)	0.3026 (Nominal)	0.3177 (Maximum)
Phase	BS Window Sum CPS	Value	Phase	SS Window Sum CPS	Value	Phase	LS Window Sum CPS	Value
Before		15350	Before		12810	Before		1506

14590 (Minimum)	15380 (Nominal)	16130 (Maximum)	12190 (Minimum)	12830 (Nominal)	13470 (Maximum)	1440 (Minimum)	1516 (Nominal)	1592 (Maximum)
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Before: Mar 4 08:29 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Photo-multiplier High Voltages Calibrations								
Phase	BS PM High Voltage (Command) V	Value	Phase	SS PM High Voltage (Command) V	Value	Phase	LS PM High Voltage (Command) V	Value
Before		1514	Before		1683	Before		1801
1396 (Minimum)	1496 (Nominal)	1596 (Maximum)	1596 (Minimum)	1696 (Nominal)	1796 (Maximum)	1711 (Minimum)	1811 (Nominal)	1911 (Maximum)

Before: Mar 4 08:29 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Crystal Quality Resolutions Calibration								
Phase	BS Crystal Resolution %	Value	Phase	SS Crystal Resolution %	Value	Phase	LS Crystal Resolution %	Value
Before		12.40	Before		10.15	Before		9.369
11.13 (Minimum)	12.13 (Nominal)	13.13 (Maximum)	9.185 (Minimum)	10.18 (Nominal)	11.18 (Maximum)	8.332 (Minimum)	9.332 (Nominal)	10.33 (Maximum)

Before: Mar 4 08:29 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
MCFL Calibration								
Phase	Raw B0 Resistivity OHMM	Value	Phase	Raw B1 Resistivity OHMM	Value	Phase	Raw B2 Resistivity OHMM	Value
Before		3835	Before		3822	Before		3814
3585 (Minimum)	3875 (Nominal)	4185 (Maximum)	3524 (Minimum)	3830 (Nominal)	4196 (Maximum)	3524 (Minimum)	3830 (Nominal)	4136 (Maximum)

Before: Mar 4 08:34 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
HILT Caliper Calibration								
Phase	HILT Caliper Zero Measurement IN	Value	Phase	HILT Caliper Plus Measurement IN	Value	Phase	HILT Caliper Minus Measurement IN	Value
Before		7.919	Before		12.06	Before		12.06
6.000 (Minimum)	8.000 (Nominal)	10.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)	9.000 (Minimum)	12.00 (Nominal)	15.00 (Maximum)

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Detector Calibration								
Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig - Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		60.58	Before		174.1	Before		185.0
0 (Minimum)	30.00 (Nominal)	120.0 (Maximum)	158.3 (Minimum)	174.1 (Nominal)	190.0 (Maximum)	150.0 (Minimum)	165.0 (Nominal)	180.0 (Maximum)

Before: Mar 4 08:26 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Zero Measurement								
Phase	CNTC Background CPS	Value	Phase	CFTC Background CPS	Value	Phase	CFTC Background CPS	Value
Master		28.24	Master		25.04	Master		25.04
Before		29.77	Before		25.81	Before		25.81
5.000 (Minimum)	29.24 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	25.04 (Nominal)	40.00 (Maximum)	5.000 (Minimum)	25.04 (Nominal)	40.00 (Maximum)

Master: Jan 10 23:41 1998

Before: Mar 4 08:27 1998

High resolution Integrated Logging Tool-CTS Wellsite Calibration								
Accelerometer Calibration								
Phase	Z-Axis Acceleration F/S2	Value	Phase	Z-Axis Acceleration F/S2	Value	Phase	Z-Axis Acceleration F/S2	Value
Before		32.14	Before		32.14	Before		32.14
31.53 (Minimum)	32.15 (Nominal)	32.84 (Maximum)	31.53 (Minimum)	32.15 (Nominal)	32.84 (Maximum)	31.53 (Minimum)	32.15 (Nominal)	32.84 (Maximum)

Before: Mar 4 14:11 1998

RECEIVED MAR 10

COMPANY:	PETROGLYPH OPERATING COMPANY INC.	BOTTOM LOG INTERVAL	6040 F
WELL:	UTE TRIBAL 31-07	SCHLUMBERGER DEPTH	6046 F
FIELD:	ANTELOPE CREEK	DEPTH DRILLER	F063 F
COUNTY:	DUCHESNE	KELLY RUSHING	6803 2 F
STATE:	UTAH	DRILLER'S DR	6802 2 F
		GEOPHYSICAL LEVEL	6793 1 F

ARRAY INDUCTION
LINEAR CORRELATION
GAMMA RAY

Schlumberger

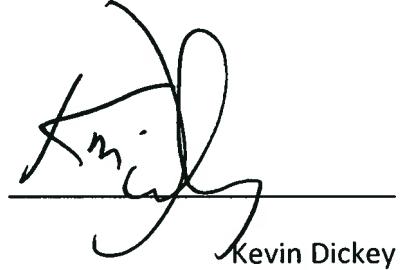
ATTACHMENT NO. 9

LIST OF OWNERS AND AFFIDAVIT NOTIFICATION

AFFIDAVIT OF MAILING

I, Kevin Dickey, Vice President, Operations, Petroglyph Energy, being first duly sworn, depose and state as follows: On July 24th, 2015, I caused to be mailed by certified mail, postage prepaid, return receipt requested, a copy of the Application to convert 1 well that appears on the attached sheet to water injection for enhanced recovery. It was sent to all parties who have an interest within ¼ mile radius from this well. The attached list contains the names of all parties who were notified.

Dated on this 24th day of July, 2015



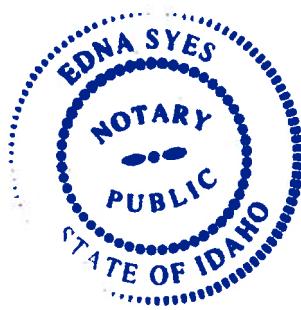
Kevin Dickey

Vice President, Operations

Petroglyph Energy

The forgoing affidavit was subscribed and sworn to before me by Kevin Dickey.

This 24 day of July, 2015.



Edna Syes
Notary Public

July 24th, 2015**Mineral, Surface, and Working Interest Owners**

To Whom It May Concern,

On July 24th, 2015 Petroglyph Energy Inc. submitted to the Environmental Protection Agency an application requesting approval to convert 19 wells to water injection wells in an enhanced recovery program. The well(s) which were submitted are all located in Antelope Creek Field which is operated under a Cooperative Plan of Development between the Ute Tribe and Petroglyph Energy.

Owners at Well's Location

Mineral: Ute Tribe

Operator: Petroglyph

Surface: Ute Tribe

Working Interest: Petroglyph 100%

Owners within Well's ¼ mile radius

No others

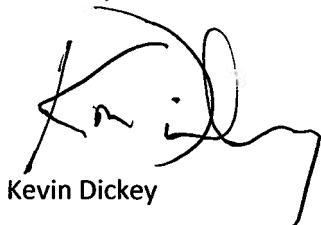
No others

No others

Anyone who would be directly and adversely affected by the authorization of the underground disposal into the Upper Green River formation may file a written request for a public hearing before the EPA. Logs and additional information on the subject wells are on file with the EPA, Groundwater Program, Mail Code 8P-W-UIC, 1595 Wynkoop St, Denver, Colorado 80202-1129.

Please contact Kevin Dickey at 208-685-7600 if you have any questions.

Sincerely,


Kevin Dickey

Vice President, Operations, Petroglyph Energy

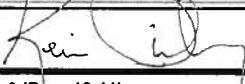
Enclosure

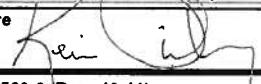
PETROGLYPH OPERATING COMPANY, INC.

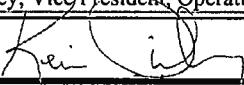
ANTELOPE CREEK FIELD

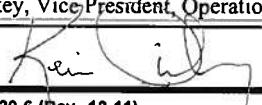
WELLS TO BE CONVERTED TO INJECTION

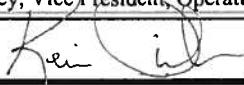
Well Name and Number	Footages	Section, Township, and Range
Ute Tribal 03-05	SHL: 2871' FNL & 752' FWL BHL: 2340' FNL & 684' FWL	3, T5S-R3W
Ute Tribal 03-12	2272' FSL & 575' FWL	3, T5S-R3W
Ute Tribal 08-11	2187' FSL 2011' FWL	8, T5S-R3W
Ute Tribal 08-12	2100' FSL & 515' FWL	8, T5S-R3W
Ute Tribal 09-01	770' FNL & 1059' FEL	9, T5S-R3W
Ute Tribal 09-04	585' FNL & 722' FWL	9, T5S-R3W
Ute Tribal 10-03	600' FNL & 1650' FWL	10, T5S-R3W
Ute Tribal 17-04	697' FNL & 636' FWL	17, T5S-R3W
Ute Tribal 17-05	1797' FNL & 620' FWL	17, T5S-R3W
Ute Tribal 17-12	2527' FSL & 612' FWL	17, T5S-R3W
Ute Tribal 20-06	2050' FNL & 1950' FWL	20, T5S-R3W
Ute Tribal 20-07	1980' FNL & 1980' FEL	20, T5S-R3W
Ute Tribal 20-11	1959' FSL & 2033' FWL	20, T5S-R3W
Ute Tribal 20-15	574' FSL & 1806' FEL	20, T5S-R3W
Ute Tribal 31-03	422' FNL & 2338' FWL	31, T5S-R3W
Ute Tribal 31-05	1980' FNL & 660' FWL	31, T5S-R3W
Ute Tribal 31-07	1976' FNL & 2168' FEL	31, T5S-R3W
Ute Tribal 31-12	1999' FSL & 748' FWL	31, T5S-R3W
Ute Tribal 36-08-E4	1796' FNL & 713' FEL	36, T5S-R4W

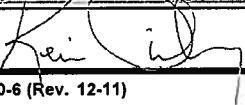
United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>																	
I. EPA ID Number <input type="text"/> U <input type="text"/> T/A <input type="text"/> C																	
Read Attached Instructions Before Starting For Official Use Only																	
Application approved mo day year			Date received mo day year			Permit Number <input type="text"/>			Well ID <input type="text"/>			FINDS Number <input type="text"/>					
II. Owner Name and Address Owner Name <input type="text"/> Petroglyph Energy, Inc.																	
Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number <input type="text"/> (208) 685-7600				Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number <input type="text"/> (208) 685-7600					
City <input type="text"/> Boise			State <input type="text"/> ID			ZIP CODE <input type="text"/> 83707			City <input type="text"/> Boise			State <input type="text"/> ID			ZIP CODE <input type="text"/> 83707		
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes								
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator											
VIII. Well Status (Mark "x")																	
<input checked="" type="checkbox"/> A Operating		Date Started mo day year <input type="text"/>			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed									
IX. Type of Permit Requested (Mark "x" and specify if required)																	
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area			Number of Existing Wells <input type="text"/> 111			Number of Proposed Wells <input type="text"/> 1			Name(s) of field(s) or project(s) <input type="text"/> Antelope Creek <input type="text"/> Ute Tribal 03-05								
X. Class and Type of Well (see reverse)																	
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain <input type="text"/>						D. Number of wells per type (if area permit) <input type="text"/> 1 well, type R							
<input type="text"/> II		<input type="text"/> R															
XI. Location of Well(s) or Approximate Center of Field or Project																	
Latitude Deg Min Sec			Longitude Deg Min Sec			Township and Range Sec Twp Range 1/4 Sec Feet From Line Feet From Line			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								
<input type="text"/> 3			<input type="text"/> 5S			<input type="text"/> 3W			<input type="text"/> NW								
XII. Indian Lands (Mark 'x')																	
XIII. Attachments <i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i> For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																	
XIV. Certification																	
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)																	
A. Name and Title (Type or Print) <input type="text"/> Kevin Dickey Vice President, Operations																	
B. Phone No. (Area Code and No.) <input type="text"/> (208) 685-7600																	
C. Signature 																	
D. Date Signed <input type="text"/> 07/27/2015																	

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>													
Read Attached Instructions Before Starting For Official Use Only													
Application approved mo day year			Date received mo day year			Permit Number		Well ID		FINDS Number			
II. Owner Name and Address													
Owner Name Petroglyph Energy, Inc.						Owner Name Petroglyph Energy, Inc.							
Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600		Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600			
City Boise			State ID	ZIP CODE 83707		City Boise			State ID	ZIP CODE 83707			
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes				
<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> Private		<input type="checkbox"/> Federal		<input type="checkbox"/> Owner		<input checked="" type="checkbox"/> Operator					
<input checked="" type="checkbox"/> No													
VIII. Well Status (Mark "x")													
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed					
IX. Type of Permit Requested (Mark "x" and specify if required)													
<input type="checkbox"/> A. Individual			<input checked="" type="checkbox"/> B. Area		Number of Existing Wells 111		Number of Proposed Wells 1		Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 03-12				
X. Class and Type of Well (see reverse)													
A. Class(es) (enter code(s)) II		B. Type(s) (enter code(s)) R		C. If class is "other" or type is code 'x,' explain				D. Number of wells per type (if area permit) 1 well, type R					
XI. Location of Well(s) or Approximate Center of Field or Project													
Latitude			Longitude			Township and Range						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Deg <input type="text"/>	Min <input type="text"/>	Sec <input type="text"/>	Deg <input type="text"/>	Min <input type="text"/>	Sec <input type="text"/>	Sec <input type="text"/> 3	Twp <input type="text"/> SS	Range <input type="text"/> 3W	1/4 Sec <input type="text"/> SW	Feet From <input type="text"/>	Line <input type="text"/>		
XIII. Attachments													
<i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i> For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.													
XIV. Certification													
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)													
A. Name and Title (Type or Print) Kevin Dickey, Vice President, Operations													
B. Phone No. (Area Code and No.) (208) 685-7600													
C. Signature 													
D. Date Signed 07/27/2015													

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>											
I. EPA ID Number <input type="text"/> U <input type="text"/> T/A <input type="text"/> C											
Read Attached Instructions Before Starting For Official Use Only											
Application approved mo day year			Date received mo day year			Permit Number		Well ID		FINDS Number	
<input type="text"/>			<input type="text"/>			<input type="text"/>		<input type="text"/>		<input type="text"/>	
II. Owner Name and Address						III. Operator Name and Address					
Owner Name <input type="text"/> Petroglyph Energy, Inc.						Owner Name <input type="text"/> Petroglyph Energy, Inc.					
Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number <input type="text"/> (208) 685-7600		Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number <input type="text"/> (208) 685-7600	
City <input type="text"/> Boise			State <input type="text"/> ID		ZIP CODE <input type="text"/> 83707		City <input type="text"/> Boise			State <input type="text"/> ID	
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes		
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator			<input type="text"/>		
VIII. Well Status (Mark "x")											
<input checked="" type="checkbox"/> A <input type="checkbox"/> Operating		Date Started mo day year <input type="text"/>			<input checked="" type="checkbox"/> B. Modification/Conversion <input type="checkbox"/>			<input type="checkbox"/> C. Proposed			
IX. Type of Permit Requested (Mark "x" and specify if required)											
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area			Number of Existing Wells <input type="text"/> 111			Number of Proposed Wells <input type="text"/> 1			Name(s) of field(s) or project(s) <input type="text"/> Antelope Creek <input type="text"/> Ute Tribal 08-11		
X. Class and Type of Well (see reverse)											
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain <input type="text"/>					D. Number of wells per type (if area permit) <input type="text"/> 1 well, type R		
<input type="text"/> II		<input type="text"/> R									
XI. Location of Well(s) or Approximate Center of Field or Project											
Latitude Deg <input type="text"/> Min <input type="text"/> Sec <input type="text"/>			Longitude Deg <input type="text"/> Min <input type="text"/> Sec <input type="text"/>			Township and Range Sec <input type="text"/> Twp <input type="text"/> Range <input type="text"/> <input type="text"/> SW <input type="text"/> 1/4 Sec <input type="text"/> Feet From <input type="text"/> Line <input type="text"/> Feet From <input type="text"/> Line			XII. Indian Lands (Mark 'x') <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
XIII. Attachments											
<i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i> For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.											
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A. Name and Title (Type or Print) <input type="text"/> Kevin Dickey, Vice President, Operations											
B. Phone No. (Area Code and No.) <input type="text"/> (208) 685-7600											
C. Signature 											
D. Date Signed <input type="text"/> 07/27/2015											

 <p>United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i></p>		I. EPA ID Number			
		U	T/A C		
Read Attached Instructions Before Starting For Official Use Only					
Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number	
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
II. Owner Name and Address			III. Operator Name and Address		
Owner Name Petroglyph Energy, Inc.			Owner Name Petroglyph Energy, Inc.		
Street Address 960 Broadway Ave. Suite 500 PO Box 70019		Phone Number (208) 685-7600	Street Address 960 Broadway Ave. Suite 500 PO Box 70019		Phone Number (208) 685-7600
City Boise	State ID	ZIP CODE 83707	City Boise	State ID	ZIP CODE 83707
IV. Commercial Facility		V. Ownership		VI. Legal Contact	VII. SIC Codes
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator	<input type="text"/>		
VIII. Well Status (Mark "x")					
<input checked="" type="checkbox"/> A Operating	Date Started mo day year <input type="text"/>	<input checked="" type="checkbox"/> B. Modification/Conversion	<input type="checkbox"/> C. Proposed		
IX. Type of Permit Requested (Mark "x" and specify if required)					
<input type="checkbox"/> A. Individual	<input checked="" type="checkbox"/> B. Area	Number of Existing Wells <input type="text"/> 111	Number of Proposed Wells <input type="text"/> 1	Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 08-12	
X. Class and Type of Well (see reverse)					
A. Class(es) (enter code(s)) <input type="text"/> II	B. Type(s) (enter code(s)) <input type="text"/> R	C. If class is "other" or type is code 'x,' explain <input type="text"/>		D. Number of wells per type (If area permit) 1 well, type R	
XI. Location of Well(s) or Approximate Center of Field or Project					XII. Indian Lands (Mark 'x') <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Latitude Deg <input type="text"/> Min <input type="text"/> Sec <input type="text"/>	Longitude Deg <input type="text"/> Min <input type="text"/> Sec <input type="text"/>	Township and Range Sec <input type="text"/> Twp <input type="text"/> Range <input type="text"/> 8 <input type="text"/> SS <input type="text"/> 3W <input type="text"/> SW <input type="text"/>		Feet From <input type="text"/>	Line <input type="text"/> Feet From <input type="text"/> Line <input type="text"/>
XIII. Attachments (Complete the following questions on a separate sheet(s) and number accordingly; see instructions)					
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A. Name and Title (Type or Print) Kevin Dickey, Vice President, Operations			B. Phone No. (Area Code and No.) <input type="text"/> (208) 685-7600		
C. Signature 			D. Date Signed <input type="text"/> 07/27/2015		

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>													
Read Attached Instructions Before Starting For Official Use Only													
Application approved mo day year			Date received mo day year			Permit Number			Well ID		FINDS Number		
II. Owner Name and Address													
Owner Name Petroglyph Energy, Inc.						Owner Name Petroglyph Energy, Inc.							
Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600		Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600			
City Boise		State ID		ZIP CODE 83707		City Boise		State ID		ZIP CODE 83707			
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator							
VIII. Well Status (Mark "x")													
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed					
IX. Type of Permit Requested (Mark "x" and specify if required)													
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area			Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 09-01				
X. Class and Type of Well (see reverse)													
A. Class(es) (enter code(s)) II		B. Type(s) (enter code(s)) R		C. If class is "other" or type is code 'x,' explain					D. Number of wells per type (if area permit) 1 well, type R				
XI. Location of Well(s) or Approximate Center of Field or Project													
Latitude			Longitude			Township and Range						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Deg <input type="text"/>	Min <input type="text"/>	Sec <input type="text"/>	Deg <input type="text"/>	Min <input type="text"/>	Sec <input type="text"/>	Sec <input type="text"/>	Twp <input type="text"/>	Range <input type="text"/>	1/4 Sec <input type="text"/>	Feet From <input type="text"/>	Line <input type="text"/>	Feet From <input type="text"/>	Line <input type="text"/>
XIII. Attachments <i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i>													
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B. Phone No. (Area Code and No.) (208) 685-7600													
C. Signature 													
D. Date Signed 07/27/2015													

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number						
												T/A	C					
U																		
Read Attached Instructions Before Starting For Official Use Only																		
Application approved mo day year			Date received mo day year			Permit Number			Well ID			FINDS Number						
II. Owner Name and Address										III. Operator Name and Address								
Owner Name Petroglyph Energy, Inc.										Owner Name Petroglyph Energy, Inc.								
Street Address 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number (208) 685-7600			Street Address 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number (208) 685-7600			
City Boise			State ID			ZIP CODE 83707			City Boise			State ID			ZIP CODE 83707			
IV. Commercial Facility				V. Ownership				VI. Legal Contact				VII. SIC Codes						
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No				<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other				<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator										
VIII. Well Status (Mark "x")																		
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed										
IX. Type of Permit Requested (Mark "x" and specify if required)																		
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area				Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 09-04								
X. Class and Type of Well (see reverse)																		
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain								D. Number of wells per type (if area permit)						
II		R										1 well, type R						
XI. Location of Well(s) or Approximate Center of Field or Project														XII. Indian Lands (Mark 'x')				
Latitude			Longitude			Township and Range										<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line					
						9	SS	3W	NW									
XIII. Attachments																		
(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)																		
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A. Name and Title (Type or Print)										B. Phone No. (Area Code and No.)								
Kevin Dickey, Vice President, Operations										(208) 685-7600								
C. Signature										D. Date Signed								
										07/27/2015								



United States Environmental Protection Agency
**Underground Injection Control
 Permit Application**

(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number		
U	T/A	C

**Read Attached Instructions Before Starting
 For Official Use Only**

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address			III. Operator Name and Address		
Owner Name Petroglyph Energy, Inc.			Owner Name Petroglyph Energy, Inc.		
Street Address 960 Broadway Ave. Suite 500 PO Box 70019		Phone Number (208) 685-7600	Street Address 960 Broadway Ave. Suite 500 PO Box 70019		Phone Number (208) 685-7600
City Boise	State ID	ZIP CODE 83707	City Boise	State ID	ZIP CODE 83707
IV. Commercial Facility		V. Ownership		VI. Legal Contact	
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No		<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other		<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator	
VII. SIC Codes					

VIII. Well Status (Mark "x")			
<input checked="" type="checkbox"/> A <input type="checkbox"/> B Operating	Date Started mo day year 111	<input checked="" type="checkbox"/> B. Modification/Conversion 1	<input type="checkbox"/> C. Proposed Antelope Creek Ute Tribal 10-03

IX. Type of Permit Requested (Mark "x" and specify if required)					
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area		Number of Existing Wells 111		Number of Proposed Wells 1	
Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 10-03					

X. Class and Type of Well (see reverse)					
A. Class(es) (enter code(s)) II	B. Type(s) (enter code(s)) R	C. If class is "other" or type is code 'x,' explain 			D. Number of wells per type (if area permit) 1 well, type R

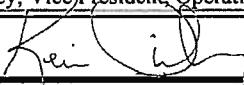
XI. Location of Well(s) or Approximate Center of Field or Project										XII. Indian Lands (Mark 'x')			
Latitude			Longitude			Township and Range							
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						10	SS	3W	NW				

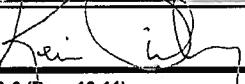
XIII. Attachments													
-------------------	--	--	--	--	--	--	--	--	--	--	--	--	--

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.

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A. Name and Title (Type or Print) Kevin Dickey, Vice-President, Operations							B. Phone No. (Area Code and No.) (208) 685-7600						
C. Signature 							D. Date Signed 07/27/2015						

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Read Attached Instructions Before Starting For Official Use Only													
Application approved mo day year			Date received mo day year			Permit Number		Well ID		FINDS Number			
II. Owner Name and Address						III. Operator Name and Address							
Owner Name Petroglyph Energy, Inc.						Owner Name Petroglyph Energy, Inc.							
Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600		Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600			
City Boise		State ID		ZIP CODE 83707		City Boise		State ID		ZIP CODE 83707			
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes				
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator							
VIII. Well Status (Mark "x")													
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed					
IX. Type of Permit Requested (Mark "x" and specify if required)													
<input type="checkbox"/> A. Individual			<input checked="" type="checkbox"/> B. Area		Number of Existing Wells 111		Number of Proposed Wells 1		Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 17-04				
X. Class and Type of Well (see reverse)													
A. Class(es) (enter code(s)) II		B. Type(s) (enter code(s)) R		C. If class is "other" or type is code 'x,' explain				D. Number of wells per type (if area permit) 1 well, type R					
XI. Location of Well(s) or Approximate Center of Field or Project													
Latitude			Longitude			Township and Range							
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line
						17	5S	3W	NW				
XII. Indian Lands (Mark 'x')													
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No													
XIII. Attachments													
<i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i> For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.													
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A. Name and Title (Type or Print) Kevin Dickey, Vice President, Operations						B. Phone No. (Area Code and No.) (208) 685-7600							
C. Signature 						D. Date Signed 07/27/2015							

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number					
												T/A		C			
U																	
Read Attached Instructions Before Starting For Official Use Only																	
Application approved mo day year			Date received mo day year			Permit Number			Well ID			FINDS Number					
II. Owner Name and Address												III. Operator Name and Address					
Owner Name Petroglyph Energy, Inc.												Owner Name Petroglyph Energy, Inc.					
Street Address 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number (208) 685-7600			Street Address 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number (208) 685-7600		
City Boise			State ID		ZIP CODE 83707		City Boise			State ID		ZIP CODE 83707					
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes								
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator											
VIII. Well Status (Mark "x")																	
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed									
IX. Type of Permit Requested (Mark "x" and specify if required)																	
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area			Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 17-05								
X. Class and Type of Well (see reverse)																	
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain					D. Number of wells per type (if area permit) 1 well, type R								
II		R															
XI. Location of Well(s) or Approximate Center of Field or Project												XII. Indian Lands (Mark 'x')					
Latitude			Longitude			Township and Range								<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line				
						17	5S	3W	NW								
XIII. Attachments																	
(Complete the following questions on a separate sheet(s) and number accordingly; see Instructions)																	
For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																	
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A. Name and Title (Type or Print)												B. Phone No. (Area Code and No.)					
Kevin Dickey, Vice President, Operations												(208) 685-7600					
C. Signature												D. Date Signed					
												07/27/2015					



United States Environmental Protection Agency
**Underground Injection Control
 Permit Application**
(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)

I. EPA ID Number

T/A	C
U	

**Read Attached Instructions Before Starting
 For Official Use Only**

Application approved mo day year	Date received mo day year	Permit Number	Well ID	FINDS Number

II. Owner Name and Address**III. Operator Name and Address**

Owner Name
 Petroglyph Energy, Inc.

Owner Name
 Petroglyph Energy, Inc.

Street Address
 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number
 (208) 685-7600

Street Address
 960 Broadway Ave. Suite 500 PO Box 70019

Phone Number
 (208) 685-7600

City
 Boise

State
 ID

ZIP CODE
 83707

City
 Boise

State
 ID

ZIP CODE
 83707

IV. Commercial Facility**V. Ownership****VI. Legal Contact****VII. SIC Codes**

Yes
 No

Private
 Federal
 Other

Owner
 Operator

--	--	--

VIII. Well Status (Mark "x")

A
 Operating

Date Started
mo day year

B. Modification/Conversion

C. Proposed

A. Individual

B. Area

Number of Existing Wells

111

Number of Proposed Wells

1

Name(s) of field(s) or project(s)

Antelope Creek
 Ute Tribal 17-12

X. Class and Type of Well (see reverse)

A. Class(es)
 (enter code(s))

B. Type(s)
 (enter code(s))

C. If class is "other" or type is code 'x,' explain

D. Number of wells per type (if area permit)

I well, type R

II

R

XI. Location of Well(s) or Approximate Center of Field or Project**XII. Indian Lands (Mark 'x')**

Latitude			Longitude			Township and Range									
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line	Yes	
						17	5S	3W	SW					No	

XIII. Attachments

(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)

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A. Name and Title (Type or Print)

Kevin Dickey, Vice President, Operations

B. Phone No. (Area Code and No.)

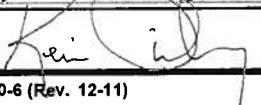
(208) 685-7600

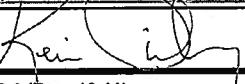
C. Signature

D. Date Signed

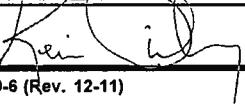
07/27/2015

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number <input type="text"/> U <input type="text"/> <input type="checkbox"/> T/A <input type="checkbox"/> C																																													
Read Attached Instructions Before Starting For Official Use Only																																																									
Application approved mo day year			Date received mo day year			Permit Number <input type="text"/>			Well ID <input type="text"/>			FINDS Number <input type="text"/>																																													
II. Owner Name and Address Owner Name <input type="text"/> Petroglyph Energy, Inc.												III. Operator Name and Address Owner Name <input type="text"/> Petroglyph Energy, Inc.																																													
Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number <input type="text"/> (208) 685-7600			Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number <input type="text"/> (208) 685-7600																																														
City <input type="text"/> Boise			State <input type="text"/> ID		ZIP CODE <input type="text"/> 83707		City <input type="text"/> Boise			State <input type="text"/> ID		ZIP CODE <input type="text"/> 83707																																													
IV. Commercial Facility <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			V. Ownership <input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			VI. Legal Contact <input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator			VII. SIC Codes <input type="text"/>																																																
VIII. Well Status (Mark "x") <input checked="" type="checkbox"/> A Date Started mo day year Operating <input type="text"/>			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed																																																			
IX. Type of Permit Requested (Mark "x" and specify if required) <input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area <input type="text"/> Number of Existing Wells <input type="text"/> 111 <input type="text"/> Number of Proposed Wells <input type="text"/> 1 <input type="text"/> Name(s) of field(s) or project(s) <input type="text"/> Antelope Creek <input type="text"/> Ute Tribal 20-06																																																									
X. Class and Type of Well (see reverse) A. Class(es) (enter code(s)) <input type="text"/> II			B. Type(s) (enter code(s)) <input checked="" type="checkbox"/> R			C. If class is "other" or type is code 'x,' explain <input type="text"/>			D. Number of wells per type (if area permit) <input type="text"/> 1 well, type R																																																
XI. Location of Well(s) or Approximate Center of Field or Project <table border="1"> <tr> <th colspan="3">Latitude</th> <th colspan="3">Longitude</th> <th colspan="6">Township and Range</th> <th colspan="3"></th> </tr> <tr> <th>Deg</th> <th>Min</th> <th>Sec</th> <th>Deg</th> <th>Min</th> <th>Sec</th> <th>Sec</th> <th>Twp</th> <th>Range</th> <th>1/4 Sec</th> <th>Feet From</th> <th>Line</th> <th>Feet From</th> <th>Line</th> </tr> <tr> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/> 20</td> <td><input type="text"/> SS</td> <td><input type="text"/> 3W</td> <td><input type="text"/> NW</td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </table>												Latitude			Longitude			Township and Range									Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line	<input type="text"/> 20	<input type="text"/> SS	<input type="text"/> 3W	<input type="text"/> NW	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	XII. Indian Lands (Mark 'x') <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								
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C. Signature 												D. Date Signed <input type="text"/> 07/27/2015																																													

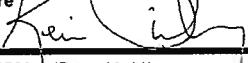
United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number <input type="text"/> U <input type="text"/> T/A <input type="text"/> C					
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City <input type="text"/> Boise			State <input type="text"/> ID			ZIP CODE <input type="text"/> 83707			City <input type="text"/> Boise			State <input type="text"/> ID			ZIP CODE <input type="text"/> 83707		
IV. Commercial Facility				V. Ownership				VI. Legal Contact				VII. SIC Codes					
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other				<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator				<input type="text"/>					
VIII. Well Status (Mark "x")																	
<input checked="" type="checkbox"/> A <input type="checkbox"/> Operating		Date Started mo day year <input type="text"/>			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed									
IX. Type of Permit Requested (Mark "x" and specify if required)																	
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area				Number of Existing Wells <input type="text"/> 111			Number of Proposed Wells <input type="text"/> 1			Name(s) of field(s) or project(s) <input type="text"/> Antelope Creek <input type="text"/> Ute Tribal 20-07							
X. Class and Type of Well (see reverse)																	
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain <input type="text"/>								D. Number of wells per type (if area permit) <input type="text"/> 1 well, type R					
<input type="text"/> II		<input type="text"/> R															
XI. Location of Well(s) or Approximate Center of Field or Project												XII. Indian Lands (Mark 'x')					
Latitude Deg <input type="text"/> Min <input type="text"/> Sec			Longitude Deg <input type="text"/> Min <input type="text"/> Sec			Township and Range Sec <input type="text"/> Twp <input type="text"/> Range <input type="text"/> 1/4 Sec <input type="text"/> SS <input type="text"/> 3W <input type="text"/> NE			Feet From Line <input type="text"/>			Feet From Line <input type="text"/>			<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
XIII. Attachments																	
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C. Signature 												D. Date Signed <input type="text"/> 07/27/2015					

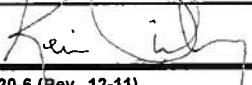
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II. Owner Name and Address						III. Operator Name and Address								
Owner Name Petroglyph Energy, Inc.						Owner Name Petroglyph Energy, Inc.								
Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600		Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600				
City Boise		State ID		ZIP CODE 83707		City Boise		State ID		ZIP CODE 83707				
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes					
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator								
VIII. Well Status (Mark "x")														
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed						
IX. Type of Permit Requested (Mark "x" and specify if required)														
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area			Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 20-11					
X. Class and Type of Well (see reverse)														
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain				D. Number of wells per type (if area permit) 1 well, type R						
II		R												
XI. Location of Well(s) or Approximate Center of Field or Project														
Latitude			Longitude			Township and Range							<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line	
						20	SS	3W	SW					
XII. Indian Lands (Mark 'x')														
XIII. Attachments (Complete the following questions on a separate sheet(s) and number accordingly; see instructions)														
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Kevin Dickey, Vice President, Operations						(208) 685-7600								
C. Signature						D. Date Signed								
						07/27/2015								

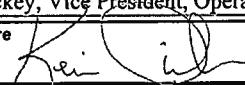
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Application approved mo day year			Date received mo day year			Permit Number		Well ID		FINDS Number	
II. Owner Name and Address											
Owner Name Petroglyph Energy, Inc.						III. Operator Name and Address					
Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600		Street Address 960 Broadway Ave. Suite 500 PO Box 70019				Phone Number (208) 685-7600	
City Boise			State ID	ZIP CODE 83707		City Boise			State ID	ZIP CODE 83707	
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes		
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator					
VIII. Well Status (Mark "x")											
<input checked="" type="checkbox"/> A <small>Operating</small>		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed			
IX. Type of Permit Requested (Mark "x" and specify if required)											
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area				Number of Existing Wells 111		Number of Proposed Wells 1		Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 20-15			
X. Class and Type of Well (see reverse)											
A. Class(es) (enter code(s)) II		B. Type(s) (enter code(s)) R		C. If class is "other" or type is code 'x,' explain				D. Number of wells per type (if area permit) 1 well, type R			
XI. Location of Well(s) or Approximate Center of Field or Project											
Latitude			Longitude			Township and Range					
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line
						20	SS	3W	SE		
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No											
XIII. Attachments											
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C. Signature 						D. Date Signed 07/27/2015					

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number U		
<i>Read Attached Instructions Before Starting For Official Use Only</i>														
Application approved mo day year			Date received mo day year			Permit Number			Well ID			FINDS Number		
II. Owner Name and Address												III. Operator Name and Address		
Owner Name <input type="text" value="Petroglyph Energy, Inc."/>												Owner Name <input type="text" value="Petroglyph Energy, Inc."/>		
Street Address <input type="text" value="960 Broadway Ave. Suite 500 PO Box 70019"/>				Phone Number <input type="text" value="(208) 685-7600"/>			Street Address <input type="text" value="960 Broadway Ave. Suite 500 PO Box 70019"/>				Phone Number <input type="text" value="(208) 685-7600"/>			
City <input type="text" value="Boise"/>			State <input type="text" value="ID"/>		ZIP CODE <input type="text" value="83707"/>		City <input type="text" value="Boise"/>			State <input type="text" value="ID"/>		ZIP CODE <input type="text" value="83707"/>		
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes					
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator								
VIII. Well Status (Mark "x")														
<input checked="" type="checkbox"/> A Operating		Date Started mo day year <input type="text"/>			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed						
<input type="checkbox"/> A. Individual		<input checked="" type="checkbox"/> B. Area			Number of Existing Wells <input type="text" value="111"/>			Number of Proposed Wells <input type="text" value="1"/>			Name(s) of field(s) or project(s) <input type="text" value="Antelope Creek
Ute Tribal 31-03"/>			
IX. Type of Permit Requested (Mark "x" and specify if required)														
<input type="checkbox"/> A. Individual		<input checked="" type="checkbox"/> B. Area												
X. Class and Type of Well (see reverse)														
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain <input type="text"/>						D. Number of wells per type (if area permit) <input type="text" value="1 well, type R"/>				
II		R												
XI. Location of Well(s) or Approximate Center of Field or Project												XII. Indian Lands (Mark 'x')		
Latitude Deg <input type="text"/> Min <input type="text"/> Sec <input type="text"/>			Longitude Deg <input type="text"/> Min <input type="text"/> Sec <input type="text"/>			Township and Range Sec <input type="text" value="31"/> Twp <input type="text" value="SS"/> Range <input type="text" value="3W"/> 1/4 Sec <input type="text" value="NW"/>						<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
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C. Signature 												D. Date Signed <input type="text" value="07/27/2015"/>		

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City Boise					State ID					ZIP CODE 83707					City Boise					State ID					ZIP CODE 83707				
IV. Commercial Facility				V. Ownership				VI. Legal Contact				VII. SIC Codes																	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other				<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator																					
VIII. Well Status (Mark "x")																													
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion				<input type="checkbox"/> C. Proposed																				
IX. Type of Permit Requested (Mark "x" and specify if required)																													
<input type="checkbox"/> A. Individual		<input checked="" type="checkbox"/> B. Area		Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 31-05																			
X. Class and Type of Well (see reverse)																													
A. Class(es) (enter code(s))			B. Type(s) (enter code(s))			C. If class is "other" or type is code 'x,' explain					D. Number of wells per type (if area permit) 1 well, type R																		
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Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line																
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Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number <input type="text"/> (208) 685-7600			Street Address <input type="text"/> 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number <input type="text"/> (208) 685-7600							
City <input type="text"/> Boise			State <input type="text"/> ID			ZIP CODE <input type="text"/> 83707			City <input type="text"/> Boise			State <input type="text"/> ID			ZIP CODE <input type="text"/> 83707							
IV. Commercial Facility				V. Ownership				VI. Legal Contact				VII. SIC Codes										
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VIII. Well Status (Mark "x")																						
<input checked="" type="checkbox"/> A <small>Operating</small>		Date Started mo day year <input type="text"/>			<input checked="" type="checkbox"/> B. Modification/Conversion 			<input type="checkbox"/> C. Proposed														
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<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area				Number of Existing Wells <input type="text"/> 111			Number of Proposed Wells <input type="text"/> 1			Name(s) of field(s) or project(s) <input type="text"/> Antelope Creek <input type="text"/> Ute Tribal 31-07												
X. Class and Type of Well (see reverse)																						
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XI. Location of Well(s) or Approximate Center of Field or Project																						
Latitude			Longitude			Township and Range												<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				
Deg <input type="text"/>	Min <input type="text"/>	Sec <input type="text"/>	Deg <input type="text"/>	Min <input type="text"/>	Sec <input type="text"/>	Sec <input type="text"/> 31	Twp <input type="text"/> 5S	Range <input type="text"/> 3W	1/4 Sec <input type="text"/> NE	Feet From <input type="text"/>	Line <input type="text"/>	Feet From <input type="text"/>	Line <input type="text"/>									
XIII. Attachments																						
(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)																						
For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																						
XIV. Certification																						
I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (Ref. 40 CFR 144.32)																						
A. Name and Title (Type or Print) <input type="text"/> Kevin Dickey, Vice President, Operations												B. Phone No. (Area Code and No.) <input type="text"/> (208) 685-7600										
C. Signature 												D. Date Signed <input type="text"/> 07/27/2015										

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number U	T/A	C			
<i>Read Attached Instructions Before Starting For Official Use Only</i>																	
Application approved mo day year			Date received mo day year			Permit Number			Well ID			FINDS Number					
II. Owner Name and Address												III. Operator Name and Address					
Owner Name Petroglyph Energy, Inc.												Owner Name Petroglyph Energy, Inc.					
Street Address 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number (208) 685-7600			Street Address 960 Broadway Ave. Suite 500 PO Box 70019						Phone Number (208) 685-7600		
City Boise			State ID		ZIP CODE 83707		City Boise			State ID		ZIP CODE 83707					
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes								
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator											
VIII. Well Status (Mark "x")																	
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed									
IX. Type of Permit Requested (Mark "x" and specify if required)																	
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area				Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 31-12							
X. Class and Type of Well (see reverse)																	
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain					D. Number of wells per type (if area permit) 1 well, type R								
II		R															
XI. Location of Well(s) or Approximate Center of Field or Project												XII. Indian Lands (Mark 'x')					
Latitude			Longitude			Township and Range									<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line				
						31	5S	3W	SW								
XIII. Attachments																	
<i>(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)</i> For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A-U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																	
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A. Name and Title (Type or Print)												B. Phone No. (Area Code and No.)					
Kevin Dickey, Vice President, Operations												(208) 685-7600					
C. Signature												D. Date Signed					
												07/27/2015					

United States Environmental Protection Agency Underground Injection Control Permit Application <i>(Collected under the authority of the Safe Drinking Water Act. Sections 1421, 1422, 40 CFR 144)</i>												I. EPA ID Number				
												T/A	C			
												U				
Read Attached Instructions Before Starting For Official Use Only																
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II. Owner Name and Address										III. Operator Name and Address						
Owner Name Petroglyph Energy, Inc.										Owner Name Petroglyph Energy, Inc.						
Street Address 960 Broadway Ave. Suite 500 PO Box 70019					Phone Number (208) 685-7600		Street Address 960 Broadway Ave. Suite 500 PO Box 70019					Phone Number (208) 685-7600				
City Boise			State ID		ZIP CODE 83707		City Boise			State ID		ZIP CODE 83707				
IV. Commercial Facility			V. Ownership			VI. Legal Contact			VII. SIC Codes							
<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No			<input checked="" type="checkbox"/> Private <input type="checkbox"/> Federal <input type="checkbox"/> Other			<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Operator										
VIII. Well Status (Mark "x")																
<input checked="" type="checkbox"/> A Operating		Date Started mo day year			<input checked="" type="checkbox"/> B. Modification/Conversion			<input type="checkbox"/> C. Proposed								
IX. Type of Permit Requested (Mark "x" and specify if required)																
<input type="checkbox"/> A. Individual <input checked="" type="checkbox"/> B. Area				Number of Existing Wells 111			Number of Proposed Wells 1			Name(s) of field(s) or project(s) Antelope Creek Ute Tribal 36-08-E4						
X. Class and Type of Well (see reverse)																
A. Class(es) (enter code(s))		B. Type(s) (enter code(s))		C. If class is "other" or type is code 'x,' explain						D. Number of wells per type (if area permit)						
II		R								1 well, type R						
XI. Location of Well(s) or Approximate Center of Field or Project														XII. Indian Lands (Mark 'x')		
Latitude			Longitude			Township and Range										<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Deg	Min	Sec	Deg	Min	Sec	Sec	Twp	Range	1/4 Sec	Feet From	Line	Feet From	Line			
						36	5S	4W	NE							
XIII. Attachments																
(Complete the following questions on a separate sheet(s) and number accordingly; see instructions)																
For Classes I, II, III, (and other classes) complete and submit on a separate sheet(s) Attachments A--U (pp 2-6) as appropriate. Attach maps where required. List attachments by letter which are applicable and are included with your application.																
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A. Name and Title (Type or Print) Kevin Dickey, Vice President, Operations														B. Phone No. (Area Code and No.) (208) 685-7600		
C. Signature 														D. Date Signed 07/27/2015		

ATTACHMENT NO. 10

WELL BORE DIAGRAMS FOR THE UIC WELL

Ute Tribal 31-07 Well History

Well History:

Spud Well: 2/25/1998
 Completed: 4/16/1998
 First Production: 4/22/1998

Tops (KB):

BMSW* Found at 1803'

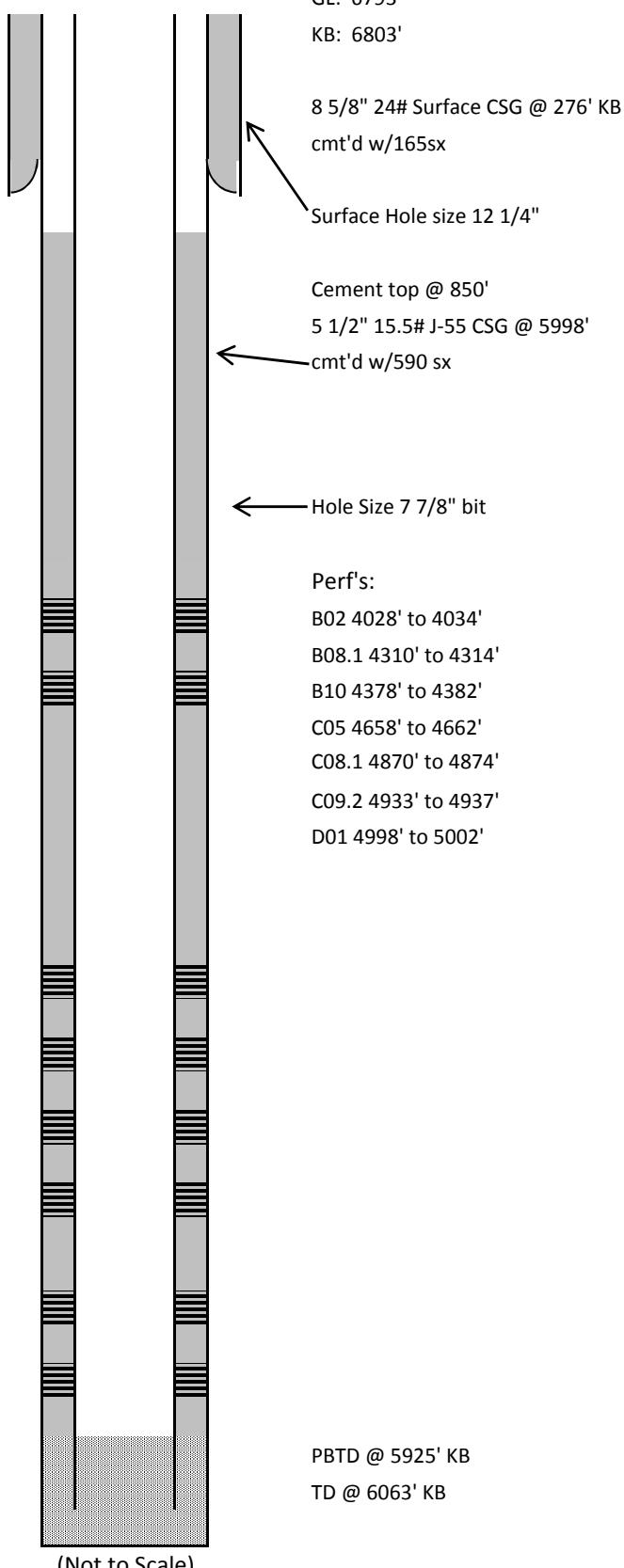
Green River 1510'
A Marker 3982'
 X Marker 4468'
 Douglas Creek 4605'
 B Limestone 4980'
 Castle Peak 5460'

Basal Carbonate 5954'

Perf History

4/9/1998

B02	4028' to 4034'
B08.1	4310' to 4314'
B10	4378' to 4382'
C05	4658' to 4662'
C08.1	4870' to 4874'
C09.2	4933' to 4937'
D01	4998' to 5002'



Petroglyph Operating Co., Inc.
 Ute Tribal #31-07
 (1976' FNL & 2168' FEL)
 SW NE Section 31, 5S- 3W
 Antelope Creek Field
 Duchesne Co. Utah
 API#: 43013320360000

*Plate 1 Utah Geological Survey Special Study 144.
 (2012). *BMSW Elevation Contour Map, Uinta Basin, Utah.* [map]. (CA 1:200,000)

Ute Tribal 31-07 Injection

Well History:

Spud Well: 2/25/1998
 Completed: 4/16/1998
 First Production: 4/22/1998

Tops (KB):

BMSW* Found at 1803'

Green River 1510'

A Marker 3982'

X Marker 4468'

Douglas Creek 4605'

B Limestone 4980'

Castle Peak 5460'

Basal Carbonate 5954'

Injection packer @ 3914'

GL: 6793'

KB: 6803'

8 5/8" 24# Surface CSG @ 276' KB

cmt'd w/165sx

Surface Hole size 12 1/4"

Cement top @ 850'

5 1/2" 15.5# J-55 CSG @ 5998'

cmt'd w/590 sx

Tubing 2 7/8" 6.5# J55

Hole Size 7 7/8" bit

Perf's:

Add B01 4004' to 4010'

B02 4028' to 4034'

B08.1 4310' to 4314'

B10 4378' to 4382'

C05 4658' to 4662'

C08.1 4870' to 4874'

C09.2 4933' to 4937'

Add D01 4996' to 4998'

D01 4998' to 5002'

Add D01 5002' to 5008'

Add D3 5054' to 5058' and 5062' to 5071'

Add E01.1 5536' to 5540'

Add E03.3 5656' to 5658' and 5664' to 5666'

Petroglyph Operating Co., Inc.

Ute Tribal #31-07

(1976' FNL & 2168' FEL)

SW NE Section 31, 5S- 3W

Antelope Creek Field

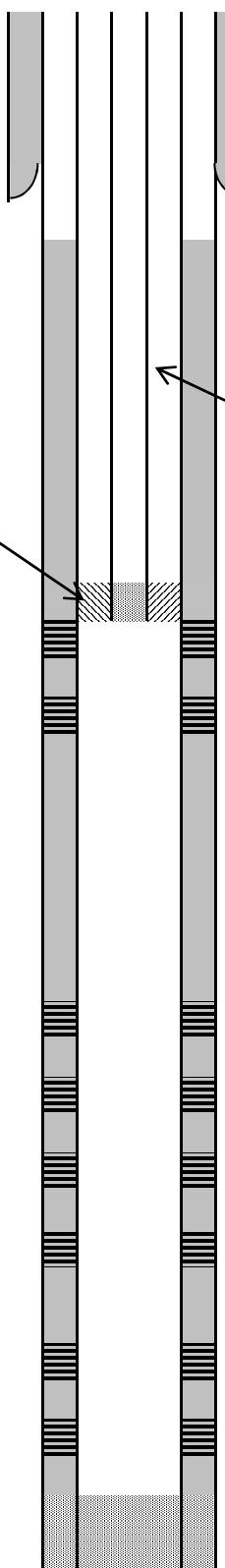
Duchesne Co. Utah

API#: 43013320360000

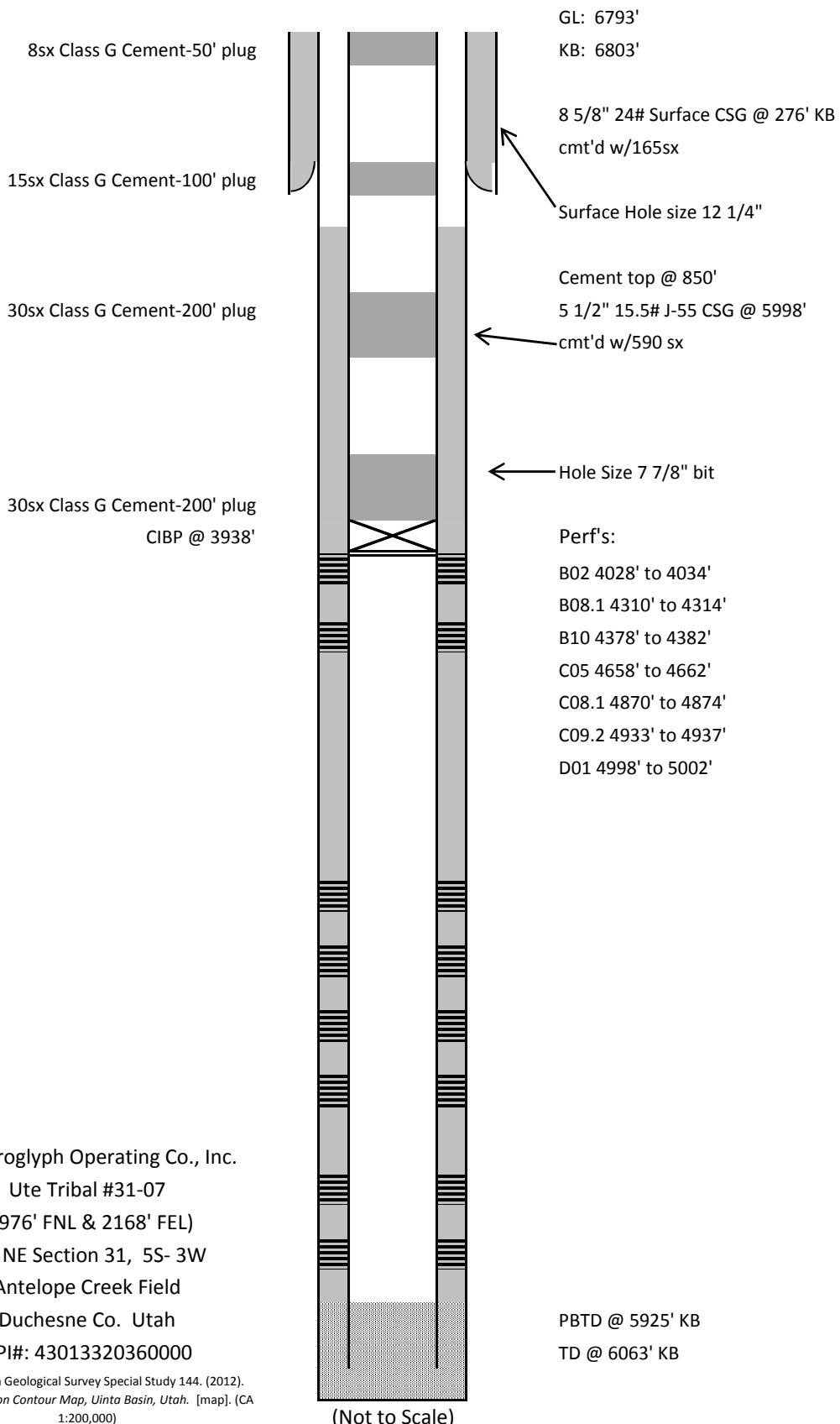
*Plate 1 Utah Geological Survey Special Study 144. (2012).

BMSW Elevation Contour Map, Uinta Basin, Utah. [map]. (CA

1:200,000)



Ute Tribal 31-07 Plug and Abandonment



*Plate 1 Utah Geological Survey Special Study 144. (2012).
BMSW Elevation Contour Map, Uinta Basin, Utah. [map]. (CA
1:200,000)

ATTACHMENT NO. 11

P&A PROCEDURE

Plug and Abandonment Procedure

Ute Tribal 31-07

43-013-32036

1. Obtain authorization from regulatory agencies for P&A procedures.
2. Set deadman. Rig up pulling unit. Rig down wellhead. Install BOP. Release packer. Trip out of hole with tubing and packer.
3. RIH Set CIBP @ 3938'.
4. Trip in hole with tubing. Establish pump rate, spot 30sxs Class G cement on top of CIBP. This will be a 200' plug.
5. Raise the tubing to 850' and set balanced 200' cement plug using 30sxs of Class G cement.
6. Raise the tubing to 276' and set balanced 100' cement plug using 15sxs of Class G cement.
7. Set balanced 50' cement plug (8sxs of Class G cement) from 50' to surface.
8. Cut off wellhead. Install plate and identification P&A post marker. Weld to casing.
9. File reports with the agencies and reclaim surface locations.

ATTACHMENT NO. 12

MIT PROCEDURE

Mechanical Integrity Test Procedure

Ute Tribal 31-07

43-013-32036

Integrity testing can be accomplished by pressuring up the annulus between the casing and the tubing. The pressure and duration of the test will be as required by the EPA.

Test Procedure Details:

1. Two weeks prior, notify EPA of pending work. Shut well in.
2. Record fluid level with echometer.
3. MIRU Service Unit.
4. POOH laying down rods and pump.
5. ND Wellhead. NU BOPs. POOH laying down 2 7/8" tubing.
6. RU Wireline. Add new perfs: B01 4004' to 4010', D01 4996' to 4998', 5002' to 5008', D3 5054' to 5058', 5062' to 5071', E01.1 5536' to 5540', and E03.3 5656' to 5658', 5664' to 5666 .
7. RD Wireline.
8. PU plug and packer and new tubing. RIH and breakdown perfs.
9. POOH. RIH with injection packer to 3914'.
10. Reverse circulate in packer fluid.
11. Set packer and ND BOPs and NU wellhead.
12. Pressure test casing-tubing annulus to 1500psi for 15 minutes.
13. RDMO.
14. Notify EPA of test, wait for approval.
15. Return to injection.

ATTACHMENT NO. 13
SURETY BOND LETTER

**SURETY BOND STATEMENT**

July 27, 2015

Petroglyph currently operates 111 injection wells in Antelope Creek Field under EPA UIC Area Permit UT2736-00000. The existing wells are covered by UIC Bond No. LPM 4138351.

Prior to final permit approval, Petroglyph will add a rider to the existing bond to include this well along with the other wells being submitted to EPA at this time.

Kevin Dickey

V.P., Operations

Petroglyph Energy, Inc.

PETROGLYPH OPERATING COMPANY, INC.